GRADED EXERCISES
IN ARITHMETIC
SIXTH YEAR—SECOND HALF

JURY—O'CONNELL—SHALLOW
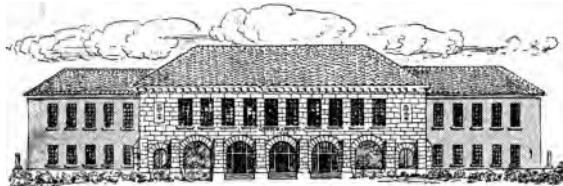
PREFACE

THIS book has been prepared for the purpose of simplifying the study of arithmetic and of fixing its facts in the memory.

It includes work for the second half of the sixth year, divided into five main parts, corresponding to the months of the usual school term. Each of these parts is again divided into twenty groups of problems, corresponding to the usual number of school days in a month. One half of the oral and the written work in each group of problems will require for completion the attention of an average class for about thirty-five or forty minutes.

Each month's work is preceded by an outline of the topics to be studied, in which the new work is distinguished from the rest by being printed in full-faced type.

Provision is made for frequent reviews, including rapid calculations in the fundamental processes and examples in the most important parts of the arithmetic previously studied. By this means a proper perspective of the subject is maintained.

While most of the material has been selected for pupils of average ability, additional problems are given for pupils of advanced standing. These problems can be used also for variety, when pupils are required to go over the grade work a second time.
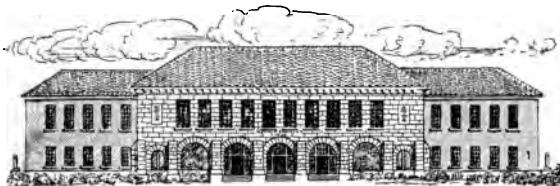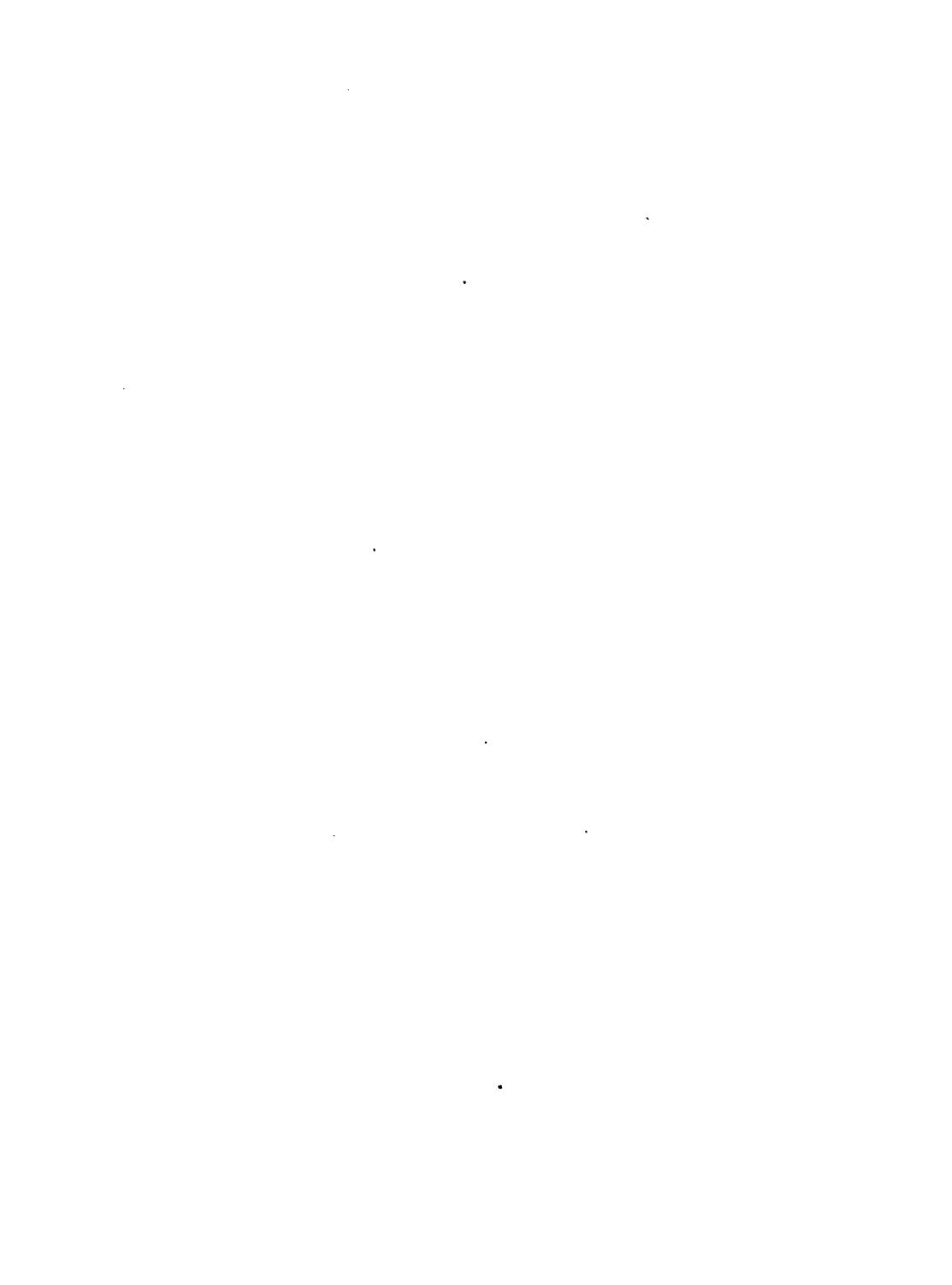
GRADED

EXERCISES IN ARITHMETIC

SIXTH YEAR — SECOND HALF

BY

MARIA JURY

ASSISTANT TO PRINCIPAL, PUBLIC SCHOOL 10, BOYS, MANHATTAN

JEROME A. O'CONNELL

MEMBER BOARD OF EXAMINERS, DEPARTMENT
OF EDUCATION, NEW YORK CITY

AND

EDWARD B. SHALLOW

ASSOCIATE SUPERINTENDENT OF SCHOOLS, NEW YORK CITY
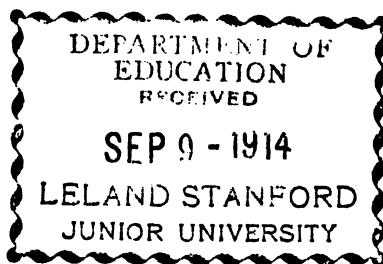
Written.

1. Write the following per cents as decimal fractions and as common fractions in their lowest terms:

Per cent	Dec. fr.	Com. fr.		Per cent	Dec. fr.	Com. fr.
1 %	= .01	= $\frac{1}{100}$		$8\frac{1}{4}$ % =		
5 % =				$\frac{3}{5}$ % =		
25 % =				$\frac{1}{2}$ % =		
$66\frac{2}{3}$ % =				150 % =		
$2\frac{1}{2}$ % =				$\frac{1}{4}$ % =		
$1\frac{1}{2}$ % =				125 % =		
$1\frac{1}{4}$ % =				$\frac{3}{4}$ % =		
300 % =				$\frac{2}{3}$ % =		

2. Find 35 % of 695 lb.

3. Find 12 % of $2105; $\frac{2}{3}$ % of $\frac{5}{8}$ yr.

4. Find 27 % of $6723; $16\frac{1}{4}$ % of $480.

5. Find the sum of the following and express the result in words: 2370.12, 59.63, 487.85, 10042.63.

---

6. Find 30 % of 44; 25 % of 140 lb.

7. Find 30 % of 8736 bu.; 40 % of 1200 men.

8. Find 105 % of $5728; 75 % of 16400 yd.

9. Find 7 % of $648.

10. Solve and express the result in words: (224.6298 × .027) ÷ 426.

· II

Oral.

Rapidly subtract:

987	449	987	915	884	788	875	872	868	692
234	345	556	678	563	338	327	575	476	307

How many hundredths of anything is 40 % of it?   60 % ?
125 % ?   8⅓ % ?   18¾ % ?   what fractional part?

What per cent of a number is $\frac{9}{10}$ of it? $\frac{6}{9}$ of it?   1½
times it? $\frac{1}{20}$ of it? $\frac{1}{50}$ of it?   (Call the number of which
you take the per cent the **base**.)

What fractional part of a number is 10 % of it?   20 %
of it?   60 % ?   80 % ?   50 % ?   25 % ?   75 % ?   12½ % ?
37½ % ?   62½ % ?   87½ % ?   33⅓ % ?   66⅔ % ?   16⅔ % ?
83⅓ % ?   14²⁄₇ % ?   11⅑ % ?

What is the result obtained by multiplying the base by
the rate called?   What is the **base**?   What is **rate per cent**?
What is **percentage**?

What part of a number is ½ % of it?   ⅓ % of it?   ¼ % ?

1. What is ½ % of $5600?

2. A broker invested $560 and gained 12½ % of his
money.   How much money has he now?*

3. I had $240 in the bank and in January put in 25 %
of that amount.   How much had I in the bank at the end
of the month?

4. A shepherd who had 360 sheep, bought 16⅔ % more.
How many had he then?

5. How many pint bottles can be filled from a hogs-
head containing 63 gal.?

Rapidly subtract:

| 927 | 931 | 330 | 872 | 946 | 842 | 993 | 447 | 862 | 807 |
| 917 | 517 | 244 | 564 | 659 | 471 | 888 | 206 | 174 | 206 |

---

* SUGGESTED EXPLANATION : If he gained 12½ % or ⅛ of his money, he
now has ⅛ of his money (the original amount) + ⅛ of it (the gain) or ⅛ of
$560.

6. What is $12\frac{1}{2}\%$ of 480? $\frac{1}{2}\%$ of 800?

7. A man who received $30 a week, had his salary raised 30%. How much did he receive after the raise?

8. A man had $250 and gave 60% of it to his son. How much did his son receive?

9. If $\frac{5}{8}$ of my money is invested in a farm, $\frac{1}{4}$ in railroad stock, and the remainder, which is $500, is deposited in a bank, how much have I in all?

10. If 1 A. of land yields 14 bu. 3 pk. of cranberries, how much should 40 A. yield?

Written.

1. Find $\frac{3}{8}$ of 824 ft.; 105% of $600.

2. Find 64% of 127 A.; 19% of $27.

3. Find 6% of $140 + 9% of $160 + 23% of $175.

4. Find $11\frac{1}{8}\%$ of $3283.47.

5. Find $\frac{1}{8}$ of $4\frac{1}{3}\%$ of $\frac{5}{8}$ of a ton. (Give the answer in pounds and ounces.)

----

6. A man who had a hogshead of cider (63 gal.) lost $15\frac{1}{2}\%$ of it by leakage. How many gallons did he lose?

7. Find 25% of 6 yd. 2 ft. 6 in.

8. If iron ore yields 63% of pure metal to the ton, how much iron is there in 16 T. of ore?

9. Find the sum of $246\frac{1}{2}$, $250\frac{1}{3}$, $783\frac{1}{4}$, $210\frac{2}{3}$, and $200\frac{7}{20}$.

10. Mr. James Downing, who owns $\frac{2}{5}$ of a mine, sells $\frac{3}{4}$ of his share for $6000. What is the value of the whole mine?

III

Oral.

Rapidly multiply :

98	74	90	59	98	79	15	31	17	184	317	915	987
2	3	4	5	6	7	8	9	9	10	10	10	10

How many hundredths of a number is 6 % of it? 8 % of it? 15 %? 40 %? 75 %?

What per cent of a number is $\frac{3}{100}$ of it? $\frac{8}{100}$ of it? .07? .16? .35? .62$\frac{1}{2}$?

Give another name for per cent.

If you take 5 % of a number, how many hundredths of the number do you take?

Find 5 % of 200 gal. What is 1 % of $500? $\frac{1}{2}$ % of $500? 25 % of 200 ft.? $\frac{1}{4}$ % of 200 ft. ?

1. James had $24 and spent $\frac{1}{2}$ % of it. How much did he spend?

2. The cost of the wood for flooring a hall is $ 250, and the labor to lay and dress it adds 60 % to the cost. What is the total cost?

3. I bought 2$\frac{1}{2}$ lb. of sugar in one store and 3$\frac{1}{4}$ lb. in another. How many pounds did I buy in all?

4. If $\frac{7}{8}$ of a load of hay is worth $14, how much are 2 loads worth?

5. How many half pints are there in 2 gal. ? in 1 qt. ?

Rapidly multiply :

92	64	87	80	17	33	45	18	15	182	456	327	982
2	3	4	5	6	7	8	9	9	10	10	10	100

6. Find ¾ % of $1200.

7. A boy who received 50 ¢ a week pocket money had it increased 50 % when he was 16 years old. How much did he get then?

8. If 72 ¢ is paid for 18 lead pencils, how much are they worth a dozen?

9. If a man pays $4 for 5 bu. of grain, how much is a peck worth?

10. If ⅔ of a dozen bananas cost 20 ¢, how much will ⅚ of a dozen cost?

Written.

1. Mr. Brown commenced business with $1500 capital, and gained 8 % the first year. What amount was he worth at the end of the year? *

2. The cotton crop of a planter last year was 450 bales; this year it is 12 % more. What is his present crop?

3. The population of Massachusetts in 1900 was 2805345; it increased in 10 yr. 20 %. What was the population in 1910?

4. A dealer bought 10 automobiles at $750 each, and sold them at a profit of 20 %. How much did he gain?

5. Sixty-two and one half per cent of a township (36 square miles) is prairie. How many acres of land in the township are prairie?

6. A man paid $420 for his taxes and 12 % more for repairs. What was the amount paid for both?

---

* SUGGESTED METHOD: 100% of money at first + 8% of money increase = 108% of his money.   108% of $1500 = ?

7. If the bread made from a barrel of flour (196 lb.) weighs $33\frac{1}{3}\%$ more than the flour, what is the weight of the bread?

8. A house and lot bought for \$3750 increased in value $112\frac{1}{2}\%$. How much were they then worth?

9. Find $33\frac{1}{3}\%$ of 127 gal. 3 qt. 1 pt.

10. At \$15 a barrel (200 lb.), find the cost of beef for a regiment of 1000 men for 30 days, allowing each man 1 lb. 8 oz. daily.

IV

Oral.

Rapidly divide:

$2\overline{)98}$ $3\overline{)57}$ $4\overline{)36}$ $5\overline{)125}$ $6\overline{)384}$ $7\overline{)357}$ $7\overline{)875}$

Find 1% of \$500; 7% of \$500; 5% of 80 yd.; 4% of 24 ft.; 20% of 40 in.; 25% of \$48.

Find 50% of 24; 30% of 60; 40% of 35.

What per cent of a number is $\frac{1}{25}$? $\frac{1}{11}$? $\frac{1}{6}$? $\frac{1}{4}$? $\frac{1}{8}$? $\frac{1}{12}$? $\frac{2}{3}$? $\frac{1}{7}$? $\frac{5}{6}$? $\frac{5}{8}$? $\frac{7}{9}$? $\frac{8}{25}$? $\frac{7}{25}$? $\frac{3}{50}$?

What fractional part of a number is 50% of it? 25%? $33\frac{1}{3}\%$? $12\frac{1}{2}\%$? $16\frac{2}{3}\%$? 20%? 60%? 70%?

Read decimally the following: 12%; 95%; 2%; 8%; 14%; 104%; $8\frac{1}{4}\%$; 300%; 210%; 100%; $8\frac{1}{3}\%$.

Change the following to expressions having the per cent sign ($\%$): .16; .125; .875; $.33\frac{1}{3}$; .625; $.00\frac{5}{8}$; $.18\frac{3}{4}$; $.31\frac{1}{4}$; .0075; $\frac{3}{8}$; $\frac{5}{6}$; $1.83\frac{1}{3}$; .05125; .0325; .75375; 2.50; .006.

What is meant by per cent? What is another name for hundredths?

1. A shepherd having 360 sheep, lost $16\frac{2}{3}\%$ of them in a storm. What part was lost? What part remained? How many sheep remained?

2. From a cask of wine containing 40 gal. $62\frac{1}{2}\%$ leaked out. How many gallons remained?

3. A farmer had 600 sheep and lost $\frac{1}{3}$ of them in a storm. What part remained? How many sheep remained?

4. John's mother gave him 96¢ last week and $16\frac{2}{3}\%$ less this week. How much did he get this week?

5. What is the area in square yards of a hall the length of which is 15 yd. and the width 15 ft.?

Rapidly divide:

$2\overline{)47}$ $3\overline{)92}$ $4\overline{)96}$ $5\overline{)69}$ $6\overline{)648}$ $10\overline{)327}$ $10\overline{)564}$

6. Ten per cent of a debt of $500 has been paid. How much is still to be paid?

7. How much twine can be manufactured from $2\frac{1}{2}$ T. of hemp, if the loss in manufacturing it is 20%?

8. My house cost me $8000. For how much a year must I rent it to get $12\frac{1}{2}\%$ of its value?

9. Jack paid $24 for a bicycle and after using it 2 mo. sold it at a loss of 20%. How much did he receive for it?

10. Find the sum of $\frac{7}{8}$ and $\frac{1}{4}$.

Written.

1. If you have a mortgage of $3000 on your house, and pay 5% interest per year, what amount of money do you pay per year?

2. Mr. Condon borrowed $1800 to improve his business and paid 6% for the use of it for the first year. How much money did he pay?

3. An oil well producing 2375 gal. a day, loses 15 % of it by leakage. What per cent of it is saved? How many gallons are saved?

4. A gardener having 1640 melons in his field, lost 20 % of them by frost in a single night. How many had he left?

5. A man who had $60, paid $8 for a hat, $6.75 for a vest, and $17.98 for a coat. He went to New York, paying $5.50 for his fare and 90 ¢ for his dinner, and while in the city bought 10 books at $1.31 each, and paid $5.50 for his hotel bill. How much money had he left?

---

6. A garrison containing 4000 soldiers lost 21 % of them by sickness and desertion. How many were left?

7. A farmer raised 468 bu. of corn and $33\frac{1}{3}$ % as many bushels of oats as of corn. How many bushels of oats did he raise?

8. Mr. Walker's income is $2500 a year, of which he spends 30 % for board, $12\frac{1}{2}$ % for clothing, and 10 % for other expenses. How much does he save in a year?

9. What is 20 % of $66\frac{2}{3}$ % of .25?

10. A man paid $5250 for a house which was $\frac{2}{7}$ of all his property. How much was he worth?

V

Oral.

Rapidly find the results:

$\frac{1}{2} + \frac{1}{4}$	$\frac{1}{2} - \frac{1}{4}$	$\frac{1}{2} \times \frac{2}{3}$	$\frac{2}{3} \div \frac{4}{5}$
$\frac{1}{2} + \frac{1}{3}$	$\frac{1}{2} - \frac{1}{3}$	$\frac{2}{3} \times \frac{3}{4}$	$\frac{2}{3} \div \frac{2}{5}$
$\frac{1}{2} + \frac{1}{6}$	$\frac{1}{2} - \frac{1}{6}$	$\frac{4}{5} \times \frac{5}{6}$	$\frac{1}{4} \div \frac{3}{5}$
$\frac{1}{2} + \frac{1}{8}$	$\frac{1}{2} - \frac{1}{8}$	$\frac{3}{4} \times \frac{5}{6}$	$\frac{1}{3} \div \frac{5}{6}$
$\frac{1}{2} + \frac{1}{10}$	$\frac{1}{2} - \frac{1}{10}$	$\frac{3}{4} \times \frac{8}{9}$	$\frac{2}{3} \div \frac{8}{9}$

1. A farmer who raised 300 bu. of wheat, sold $66\frac{2}{3}\%$ of it. How many bushels did he sell?

2. A spelling test paper containing 20 words was marked 75%. How many words were spelled incorrectly?

3. A class having 32 pupils was increased $12\frac{1}{2}\%$. How many pupils were there in the class then?

4. If I can buy $2\frac{1}{2}$ yd. of cloth for $80\cancel{c}$, how much must I pay for $3\frac{1}{8}$ yd. at the same rate?

5. How much does a piece of land cost if .9 of it costs $1800?

———

Rapidly find the results:

$\frac{1}{3}+\frac{1}{4}$	$\frac{1}{3}-\frac{1}{4}$	$\frac{1}{2}\times\frac{4}{5}$	$\frac{3}{4}+3$
$\frac{1}{3}+\frac{1}{6}$	$\frac{1}{3}-\frac{1}{6}$	$\frac{2}{3}\times\frac{9}{14}$	$12\div\frac{6}{7}$
$\frac{1}{3}+\frac{1}{5}$	$\frac{1}{3}-\frac{1}{5}$	$\frac{3}{4}\times\frac{8}{15}$	$1\frac{1}{2}\div\frac{1}{2}$
$\frac{1}{3}+\frac{1}{9}$	$\frac{1}{3}-\frac{1}{9}$	$\frac{5}{6}\times\frac{6}{25}$	$\frac{3}{4}\div2\frac{2}{3}$
$\frac{1}{3}+\frac{1}{12}$	$\frac{1}{3}-\frac{1}{12}$	$\frac{4}{7}\times\frac{7}{8}$	$1\frac{1}{2}\div2\frac{2}{3}$

6. Find $\frac{3}{8}\%$ of $1600.

7. If a farmer loses 3% of 200 T. of hay in a storm, how many tons does he lose?

8. There are 48 pupils on register in a class, and one stormy day $37\frac{1}{2}\%$ of the number were absent. How many were present?

9. How many $\frac{3}{4}$-lb. packages can be filled from a 48-lb. box of tea?

10. A can do a piece of work in 3 days and B in 4 days. How long will it take them working together?

Written.

1. If on an average 75 % of the eggs placed in an incubator hatch and 90 % of the chickens transferred to the brooder live, how many chickens can a farmer raise from 80 doz. eggs?

2. A drover who was taking 2320 sheep to market lost 25 % of them by a railroad accident. How many had he left?

3. A merchant who had $7250 in bank deposited $12\frac{1}{2}$ % more. How much did he then have?

4. A tree casts a shadow of 48 ft., which is $\frac{3}{4}$ of its height. How high is the tree?

5. In 1910 the population of the five largest cities in the United States was as follows: New York 4766883, Chicago 2185283, Philadelphia 1549008, St. Louis 687-029, and Boston 670585. What was the total population of these cities?

---

6. If a man owes $3564 and pays 30 % of it, how many dollars does he pay?

7. A man bought goods to the amount of $375.60 and sold them so as to gain 30 % of the cost. How much did he receive for them?

8. From a bill of goods amounting to $642, 5 % was deducted. What was the amount paid?

9. Find $37\frac{1}{2}$ % of 6 yd. 2 ft. 8 in.

10. If $\frac{5}{6}$ of a ship is worth $8360, what is the value of the ship?

VI

Oral.

Rapidly find:

20 % of 200	$\frac{1}{2}$ % of 600	20 % of 40 yd.
25 % of 500	$\frac{1}{3}$ % of 900	$33\frac{1}{3}$ % of 15 ft.
$33\frac{1}{3}$ % of 2700	$\frac{1}{4}$ % of 800	$37\frac{1}{2}$ % of 32 in.
$66\frac{2}{3}$ % of 1800	$\frac{1}{6}$ % of 1200	$6\frac{1}{4}$ % of 64 lb.

How many hundredths of 100 is 7? 20? 25?

What part of 5 is 2? of 8 is 7? of 6 is 3? of 12 is 8? Explain the work.

A gain of 3 on 5 is a gain of how much on the hundred? Explain the work.

What is the gain on 100 when the gain is 4 on 20? 5 on 20? 4 on 25?

What is the rate per hundred at a gain of 15 on 60? of 3 on 12? of 5 on 20? of 6 on 24? What other name may we call the rate per hundred?

What part of 80 pk. is 20 pk.? How many hundredths? What per cent of $75 is $15?

1. In a quantity of apples 5 bbl. of every 100 bbl. are rotten. What per cent is rotten?

2. A miller keeps 6 bu. of every 100 bu. that he grinds. What per cent does he keep?

3. What per cent of 1 da. is 16 hr.? (Explain this.)

4. What per cent of 40 lb. is 15 lb.? *

5. Find $3\frac{1}{3}$ % of 90 bu. of corn.

---

* Suggested Explanation:

15 lb. is $\frac{15}{40}$ of 40 lb. or $\frac{1}{4}$ and $\frac{1}{8}$ of 100% = ? %.

Rapidly find:

40 % of 200	½ % of 800	25 % of 120 yd.
35 % of 100	⅓ % of 1200	12½ % of 16 ft.
37½ % of 800	¼ % of 200	62½ % of 24 in.
8⅓ % of 600	⅕ % of 1000	14⅔ % of 28 lb.

6. What per cent of 225 is 15? (Explain this.)

7. What per cent of 300 mi. is 180 mi.? (Explain this.)

8. What per cent of $160 is $56? (Explain this.)

9. Find ⅛ % of $100.

10. If 3¼ oz. of gold dust cost 39¢, how much will .50 of an ounce cost?

Written.

1. What per cent of 12½ mi. is 6¼ mi.? *

2. What per cent of $25 is $¼? of ⅔ is 3⅛?

3. What per cent of $18 is $19.20? of 640 mi. is 90.88 mi.?

4. What per cent of a pound avoirdupois is 8 ounces? 12 ounces?

5. I sold 72 yd. of carpeting at $2 a yard, and thereby gained $18. How much did it cost me per yard?

---

6. What per cent of 890 lb. is 120.15 lb.?

7. What per cent of $12 is 30¢?

8. A man who failed in business had only $2100 worth of goods. He owed $6000. What per cent will his creditors receive?

* STATEMENT : $\dfrac{\text{Percentage}}{\text{Base}}$ = Rate. $\dfrac{6¼}{12½}$ = ? = ? %.

9. What is $2\frac{1}{4}$ times $\frac{1}{3}$ % of $66\frac{1}{2}$ gal.? Give your answer in quarts, pints, and gills.

10. A can do a piece of work in $3\frac{1}{2}$ days, B in 3 days, and C in $2\frac{3}{4}$ days. How many days will it take them to do the work if they all work together?

VII

Oral.

Rapidly give the per cent gain of

8 on 16	10 on 40	16 on 80	12 on 36
5 on 25	15 on 90	20 on 60	15 on 20
4 on 80	18 on 72	15 on 60	14 on 28
3 on 60	12 on 48	48 on 72	36 on 54

Find 5 % of 100 bu.; of 200 yd.; of $500.

Find 50 % of 200 ft.; of 600 bu.; of 300 rd.

Find $\frac{1}{2}$ % of $400; of 600 gal.; of 800 in.

1. What per cent of 24 A. is 15 A.?

2. What per cent of $12\frac{1}{2}$ is 2? of $\frac{1}{2}$ is $\frac{1}{4}$?

3. If it costs 25 ¢ to send a ten-word telegram to New Haven and 2 ¢ for every additional word, how much will it cost me to send a telegram of 18 words?

4. If 9 yd. of ribbon cost $2.50, how much will 27 yd. cost?

5. How much is $\frac{1}{4}$ % of 80 lb. of sugar?

———

Rapidly give the per cent gain of

30 on 50	25 on 75	10 on 40	2 on 50
20 on 25	60 on 80	30 on 70	$\frac{1}{2}$ on 10
15 on 40	75 on 100	16 on 48	3 on 75
18 on 36	15 on 25	16 on 64	3 on 36

6. I deposited $80 in the bank last year and $100 this year. What was the per cent of increase?

7. A farmer raised 800 bu. of corn, but 20 % of it was damaged by rain. How many bushels were good?

8. Seventeen and a half is what per cent of 50?

9. If 8¼ lb. cost 33 ¢, how much will 3¼ lb. cost?

10. Find ⅕ % of 50 yd.

Written.

1. Add: 35978
473879
491673
102368
89123
45678
389265
873569
67536

2. Find the total cost of 8⅛ yd. at $3½ a yard; 4⅜ yd. at $2⅗ a yard; and 5¼ yd. at $2⅔ a yard.

3. In a certain year the cotton crop of the United States amounted to 10651000 bales. Of this amount, Texas raised 2653000 bales. What per cent of the entire crop was raised in Texas?

4. If there are 555000000 A. of woodland in the United States, how many square miles of it are there?

5. A farmer raised 5390 bu. of grain and sold 1078 bu. What per cent of it did he sell?

---

6. In one month clover seed advanced from $6.50 to $7 per 100 lb. What was the rate per cent of increase?

7. What per cent of 3 yd. 2 ft. 5 in. is 7 ft.?

8. A lady who had invested funds to the amount of $4750, on withdrawing the money received $4987.50. How much money did she gain? What per cent of her money did she gain?

9. An operator mined 12600 T. of coal; he paid 20 % for mining and 25 % for transportation. How many tons had he remaining?

10. A farmer who had 800 bu. of wheat, sold $12\frac{1}{2}$ % of it to one man and $14\frac{2}{7}$ % of the remainder to another. How many bushels remained?

VIII

Oral.

Rapidly find the percentage :

Base	Rate	Base	Rate	Base	Rate
60	20 %	600	25 %	200	$\frac{1}{2}$ %
80	$12\frac{1}{2}$ %	400	20 %	600	$\frac{1}{3}$ %
40	25 %	360	$33\frac{1}{3}$ %	800	$\frac{1}{4}$ %
20	75 %	480	$16\frac{2}{3}$ %	500	$\frac{2}{5}$ %
80	$37\frac{1}{2}$ %	320	$6\frac{1}{4}$ %	900	$\frac{2}{3}$ %

1. What part of a number is $15\frac{1}{2}$ % of it?

2. What per cent of $33\frac{1}{3}$ is 30?

3. If $3\frac{1}{6}$ cwt. cost $38, how much will $\frac{1}{2}$ of a ton cost?

4. If $4\frac{1}{4}$ yd. of ribbon cost 34¢, how much will .25 yd. cost?

5. Six is what per cent of $16\frac{2}{3}$?

Rapidly give the percentage :

Base	Rate	Base	Rate	Base	Rate
350	$14\frac{2}{7}$ %	48	$6\frac{1}{4}$ %	300	$\frac{1}{2}$ %
120	20 %	90	$3\frac{1}{3}$ %	250	$\frac{2}{5}$ %
560	$87\frac{1}{2}$ %	25	60 %	480	$\frac{3}{4}$ %
270	$33\frac{1}{3}$ %	45	$11\frac{1}{9}$ %	320	$\frac{1}{8}$ %
240	$66\frac{2}{3}$ %	60	$8\frac{1}{3}$ %	240	$\frac{1}{6}$ %

6. A man had $600 in the bank and drew out $16\frac{2}{3}$ % of it. How much did he draw out?

7. When you have written 40 % of a spelling lesson of 20 words, how many words have you still to write?

8. Decrease 1000 by 10 %, then increase the remainder by $33\frac{1}{3}$ %.

9. If 4 boxes of raisins cost $7, how much will 12 boxes cost?

10. What part of a barrel of flour is contained in a 49-pound bag?

Written.

1. A trader who had $1820 spent 25 % of it. How much had he left?

2. A merchant who had $1650, spent $13\frac{1}{3}$ % of it for coffee at 23 ¢ a pound. How many pounds of coffee did he buy?

3. A farmer who raised 1920 bu. of corn, sold $37\frac{1}{2}$ % of it at 48 ¢ a bushel. How much did he receive for the quantity sold?

4. A farmer sold 60 % of 240 A. of land for $10800. What price per acre did he receive?

5. How many pint bottles can be filled from a hogshead (63 gal.)?

6. A speculator had $10400 in bank. If he drew out $62\frac{1}{2}$ % of it to purchase wool at 50 ¢ a pound, how many pounds did he buy?

7. An agent sold a farm of 120 A. at $62.50 per acre, and invested 66 % of the money in suburban lots at $330 each. How many lots did he buy?

8. What per cent of 4 bu. 2 pk. 6 qt. is 1 bu. 5 qt. 1 pt.?

9. What per cent of 9 yd. 3 in. is 6 yd. 2 in. ?

10. By draining a field, a farmer increased the yield of hay from $37\frac{1}{2}$ T. to 50 T.   What per cent was the increase ?

IX

Oral.

Rapidly find the amount:

Base	Rate	Base	Rate	Base	Rate
200*	20 %	16 bu.	$37\frac{1}{2}$ %	$120	75 %
100	25 %	24 yd.	$12\frac{1}{2}$ %	102 mi.	$16\frac{2}{3}$ %
$30	20 %	300	$33\frac{1}{3}$ %	240 ft.	$12\frac{1}{2}$ %
600	50 %	45 sheep	$66\frac{2}{3}$ %	280 in.	$14\frac{2}{7}$ %
500	20 %	$80	$37\frac{1}{2}$ %	$360	25 %

1. If coffee loses 15 % of its weight in roasting, what is the loss in weight of a bag of coffee weighing 140 lb. ?

2. In a school of 120 pupils, 45 % are girls.   How many boys are there in the school ?

3. A man who owned $\frac{3}{4}$ of the stock of a vessel sold $33\frac{1}{3}$ % of his share.   What part did he then own ?

4. Jane had $\frac{1}{2}$ a dozen pens and bought $\frac{5}{6}$ of a dozen. How many pens had she then ?

5. What is $\frac{5}{6}$ % of 24 ?

Rapidly find the amount:

Base	Rate	Base	Rate	Base	Rate
36	25 %	800	3 %	54	$11\frac{1}{9}$ %
20	150 %	200	5 %	56	$37\frac{1}{8}$ %
60	$116\frac{2}{3}$ %	250	8 %	63	$14\frac{2}{7}$ %
64	$87\frac{1}{2}$ %	400	$\frac{1}{4}$ %	72	25 %
40	75 %	600	$\frac{1}{3}$ %	48	$33\frac{1}{3}$ %

* SUGGESTED METHOD : $200 \times \frac{2}{3} = ?$ or $\frac{2}{3}$ of $200 = ?$

Read the following decimals as per cents:

.12; .05; .005; .375; .0375; .625; .0625; .00625.

6. A farmer put into his two barns 600 T. of hay. How much did it weigh after losing 2 % by drying?

7. Last year the yield of a certain wheat field of a city was 10000 bu. What is its present yield if improved fertilizing has increased it 20 % ?

8. Reduce $\frac{1}{200}$ to a decimal.

9. Divide .32 by 100; multiply .32 by 100.

10. Divide $\frac{5}{6}$ by 10; divide 10 by $\frac{5}{6}$.

Written.

1. Reduce 2 pk. 6 qt. 1 pt. to the fraction of a bushel.

2. How many loads of gravel, spread 10 in. deep, will be required for a road $2\frac{1}{4}$ mi. long, and 12 ft. wide?

3. How many cubic feet of air are there in a room 40 ft. 6 in. long, 28 ft. 4 in. wide, and 16 ft. 8 in. high?

4. Find approximately what per cent of the distance from San Francisco to Yokohama (5500 mi.), the distance from New York to London (3200 mi.) is.

5. Which is greater and how much, $6\frac{1}{4}$ % of 52250, or $3\frac{1}{2}$ % of 96470?

6. Reduce 18 sq. yd. 7 sq. ft. 25 sq. in. to square inches.

7. How many cubic yards are equivalent to the amount of earth in a cellar 45 ft. long, 20 ft. wide, and 6 ft. deep?

8. At $62\frac{1}{2}$ ¢ a cubic yard, how much will it cost to build a wall 84 ft. long, 18 ft. high, and 3 ft. 6 in. thick?

9. What is the difference between $3\frac{1}{4}\%$ of $18000 and $2\frac{1}{2}\%$ of $19000?

10. What rate per cent is charged by an auctioneer who requires $60 for selling $4000 worth of furniture?

X

Oral.

Rapidly find the difference:

Base	Rate	Base	Rate	Base	Rate
160 *	25 %	60	50 %	350	20 %
120	30 %	40	75 %	480	25 %
480	$12\frac{1}{2}$ %	36	$16\frac{2}{3}$ %	320	$12\frac{1}{2}$ %
600	$33\frac{1}{3}$ %	64	$37\frac{1}{2}$ %	420	$16\frac{2}{3}$ %
400	50 %	24	$12\frac{1}{2}$ %	240	$33\frac{1}{3}$ %

1. How much is $16, plus 25 % of itself?

2. A farmer sold 20 % of 400 bu. of grain. How many bushels remained?

3. A farmer who had 25 bbl. of apples, sold 60 % of them at $2 a barrel. How much did he receive for them?

4. If $\frac{5}{8}$ of an acre of land is worth $35, how much is one acre worth?

5. If a man earns $2\frac{1}{5}$ a day, how many days will it take him to earn $55?

Rapidly find the difference:

Base	Rate	Base	Rate	Base	Rate
$240	$66\frac{2}{3}$ %	$320	$6\frac{1}{4}$ %	$720	$87\frac{1}{2}$ %
$360	$83\frac{1}{3}$ %	$168	$37\frac{1}{2}$ %	$420	60 %
$400	50 %	$800	$37\frac{1}{2}$ %	$200	40 %
$800	25 %	$960	$16\frac{2}{3}$ %	$480	25 %
$480	$12\frac{1}{2}$ %	$450	$33\frac{1}{3}$ %	$320	$6\frac{1}{4}$ %

* SUGGESTED METHOD: $160 \times \frac{1}{4} = ?$ or $\frac{1}{4}$ of $160 = ?$

6. If a man has invested $2000 in a stock farm and 75 % more in a wheat field, how much money has he invested in his wheat field?

7. One pint is what per cent of a gallon?

8. What is the value of 16⅔ % of 60 bu. of wheat at $1.25 per bushel?

9. A pigeon can fly 20 mi. farther in an hour than in ⅗ of an hour. How far can it fly in one hour?

10. If ⅔ of a barrel of flour costs $3⅔, what is the cost of a barrel?

Written.

1. Mr. Baker bought a house for $6875 and made a payment of $2475. What per cent was still due?

2. After a ship had made 56 % of a voyage between New York and Panama, how many miles had it still to go?

3. On Dec. 23, Mrs. Lloyd bought a writing desk for $4.25, a glove box for $1.25, a handkerchief case for $1.50, a sewing case for $2.75, and a lady's dressing case for $6.75. Make out a bill, giving the name of a store in which such articles may be purchased, receipt the bill, and find how much change should be received from a twenty-dollar bill.

4. New York, Jan. 1, 1913. Mr. Thomas Wilson bought of Park & Tilford: 25 lb. coffee @ 25¢; 4 gal. molasses @ 20 ¢; 20 lb. sugar @ 5¢; 8 lb. tea @ 50¢; 6 lb. butter @ 30¢. Make out the bill in proper form. Receipt it.

5. In one year the War Department expended $1765.25 for mucilage at $5.75 a dozen quarts. How many quarts were purchased?

6. A man who had $5000 invested 20 % of it in bonds, 40 % of the remainder in bank stock, and the remainder in real estate. How much did he invest in real estate?

7. From a bill of goods amounting to $642, 5 % is deducted. What is the amount deducted, and the amount paid?

8. Robert James bought of Briggs & Co. $\frac{1}{2}$ gro. table knives and forks, @ $8.40; $\frac{1}{2}$ doz. razors, @ $9; $\frac{1}{2}$ doz. pocket knives, @ $6; $\frac{1}{12}$ doz. cheese knives at $9.60. Make out the bill and receipt it.

9. How many feet are there in 16 rd. 2 yd. 1 ft. ?

10. $(2.04 \div 17 + .235 \times 5000) - \frac{7}{8} = ?$

XI

Oral.

Rapidly find the rate:

Base	Percentage	Base	Percentage	Base	Percentage
$24	$12	50 yd.	40 yd.	100	6
$75	$50	15 ft.	3 ft.	150	50
$48	$36	75 in.	25 in.	150	25
$30	$27	75 bu.	15 bu.	200	40

50 is $\frac{5}{8}$ of what number?   50 is $.62\frac{1}{2}$ of what number? 50 is $62\frac{1}{2}$ % of what number?   32 is 80 % of what number?

What are the terms used in percentage? Tell what is meant by the base; by the rate; by the percentage. In the statement 45 is $62\frac{1}{2}$ % of 72, which is the base? the rate? the percentage? In the example 27 is 60 % of what number, what term is missing? Analyze this example. Tell how to find the base when the percentage and the rate are given.

1. 150 is 60 % of what number ? *

2. If $15 is 15 % of my money, how much have I ?

3. A man spent 25 ¢, which was 2½ % of the money he had in his pocket. How much money had he?

4. Three quarts is 15 % of how many gallons?

5. What is the difference between 6 sq. ft. and 6 ft. square?

Rapidly find the rate :

Base	Percentage	Base	Percentage	Base	Percentage
350	70	300	180	60	15
420	60	720	480	·84	12
400	50	600	400	72	48
300	75	550	110	72	36

6. James has 60 marbles which are 30 % of the number Robert has. How many has Robert?

7. If $70 is 20 % of the money given for a carriage, how much was paid for it?

8. Four ounces is 5 % of how many pounds?

9. Sixteen pints is 100 % of how many quarts?

10. A boy lost 9 marbles, which was ⅜ of twice the number he had at first. How many had he left?

Written.

1. 144 is 75 % of what number ? †

---

* SUGGESTED EXPLANATION: 60 % = $\frac{60}{100}$, or ⅗. Since 150 is ⅗ of a number, ⅕ of the number will be ⅓ of 150 and ⅗ of the number, or the whole number, will be ⅗ of 150.

† $\frac{\text{Percentage}}{\text{Rate}}$ = Base. 144 ÷ 75% = ? Or, 144 ÷ ¾ = ?

2. If $6840 is 30% of a man's money, how much money has he?

3. If 1240 bu. of corn is 62% of a farmer's crop, how many bushels does he raise?

4. I received $225 for a horse, which was $112\frac{1}{2}$% of what I paid for it. How much did I pay for it?

5. If $6.51 is 31% of the fare from Philadelphia to Chicago, how much is the fare?

6. The number of pupils in attendance at school in a certain town is 996, which is 83% of the whole number of pupils. How many pupils are there?

7. The number of children in a city attending school is 13650, which is 21% of the population. What is the population of that city?

8. A merchant invested $6000 in business. He gained 23% the first year. The second year he lost 20% of what he had at the end of the first year. What per cent of his original money has he now in business?

9. What per cent of 6 bu. is 3 pk.?

10. At 80¢ a yard, how much will $4\frac{3}{8}$ bales of cloth cost, each bale containing 43.75 yd.?

XII

Oral.

Rapidly find the base:

Percentage	Rate	Percentage	Rate	Percentage	Rate
50	20 %	16	80 %	32	80 %
30	30 %	27	75 %	48	75 %
25	25 %	56	$87\frac{1}{2}$ %	36	$66\frac{2}{3}$ %
15	60 %	42	$16\frac{2}{3}$ %	40	25 %
24	50 %	20	25 %	24	75 %

1. James has $35, which is 5 % of what his brother has. How much has his brother?

2. A real estate agent received $700 for selling country property which was 5 % of the sale price. For how much did he sell the property?

3. If wages are advanced from $1.50 a day to $1.75 a day, what is the per cent of increase?

4. My house and lot cost me $4800, and the house cost 37½ % of that amount. What was the cost of the house?

5. How long is a room that is 20 ft. wide and contains 480 sq. ft.?

Rapidly find the base:

Percentage	Rate	Percentage	Rate	Percentage	Rate
50	33⅓ %	36	50 %	160	80 %
28	80 %	80	80 %	200	20 %
18	60 %	32	66⅔ %	180	75 %
24	66⅔ %	40	20 %	360	66⅔ %
14	25 %	25	25 %	250	83⅓ %

6. A premium of $70 is 5 % on what valuation?

7. Mr. Campbell's income of $2000 is 5 % of the sum he invested. How much has he invested?

8. If I pay $5 for the use of $100 for a year, what per cent do I pay?

9. If I pay a broker $15 for selling a piece of land for $1200, what per cent do I pay?

10. How much will 2 gal. 3 qt. of brandy cost at $3.60 per gallon?

Written.

1. A man's expenses are $36 a month and this amount is 54 % of his salary. How much does he save?

2. A merchant who owned $\frac{3}{4}$ of a ship, sold 25% of his share for $24000.   What was the value of the ship?

3. A man's income in 3 yr. was $4560.   The second year it was 35 % more than the first, and the third year 45 % more than the first.   What was his income each year?

4. Fourteen dollars and forty cents is how many per cent of $ 54?

5. What number diminished by $\frac{2}{5}$ and $\frac{2}{7}$ of itself leaves a remainder of 720 ?   _____

6. If the base is $ 6500, and the rate $\frac{2}{5}$ %, what is the difference?

7. In 1902 the total mileage of the railroads in the United States was about 202500 mi., and in 1910 about 240500 mi.   What was the per cent of increase ?

8. If I receive in dividends $ 400 a year upon stocks which cost me $ 9200, what per cent do I receive on my investment?

9. I owned 80 % of a ship, and I sold 25 % of my share for $ 19800.   What was the entire value of the ship ?

10. Simplify $\dfrac{\frac{3}{4} \div \frac{2}{3}}{1\frac{1}{4} \div \frac{7}{9}} \div \dfrac{\frac{1}{2}}{\frac{5}{7}}$.

XIII

Oral.

Rapidly add :

$\frac{1}{2} + \frac{2}{3}$	$\frac{1}{2} + \frac{5}{6}$	$\frac{2}{3} + \frac{1}{4}$	$\frac{3}{4} + \frac{5}{6}$
$\frac{1}{3} + \frac{3}{4}$	$\frac{1}{2} + \frac{1}{4}$	$\frac{2}{3} + \frac{3}{4}$	$\frac{3}{4} + \frac{1}{5}$
$\frac{1}{2} + \frac{3}{4}$	$\frac{1}{3} + \frac{1}{4}$	$\frac{2}{3} + \frac{5}{6}$	$\frac{3}{4} + \frac{2}{5}$
$\frac{1}{3} + \frac{5}{6}$	$\frac{1}{4} + \frac{1}{5}$	$\frac{3}{4} + \frac{1}{6}$	$\frac{3}{4} + \frac{3}{5}$

1. If a man can earn 5\frac{1}{4}$ in 3 days, how much can he earn in 6 days ?

2. How many square yards are there in a floor 27 ft. by 20 ft.?

3. How many square feet are there in the surface of a ceiling 15 ft. by 12 ft.? How much will it cost to paint the ceiling at 10 ¢ a square foot?

4. What remains of an income of $800 after $62\frac{1}{2}\%$ has been spent?

5. A house is rented for $1500, which is $12\frac{1}{2}\%$ of its value. What is its value?

Rapidly add:

$\frac{1}{5} + \frac{1}{6}$	$\frac{2}{5} + \frac{1}{6}$	$\frac{1}{5} + \frac{5}{6}$	$\frac{1}{2} + \frac{1}{7}$
$\frac{1}{5} + \frac{1}{10}$	$\frac{3}{5} + \frac{1}{6}$	$\frac{1}{3} + \frac{1}{6}$	$\frac{1}{2} + \frac{3}{7}$
$\frac{2}{5} + \frac{1}{10}$	$\frac{4}{5} + \frac{1}{10}$	$\frac{2}{3} + \frac{1}{6}$	$\frac{1}{2} + \frac{4}{7}$
$\frac{3}{5} + \frac{1}{10}$	$\frac{4}{5} + \frac{1}{6}$	$\frac{2}{3} + \frac{5}{6}$	$\frac{1}{2} + \frac{6}{7}$

6. A farmer having 400 sheep loses 20% of them and sells 25% of the remainder. How many does he sell?

7. What per cent of 3 sq. ft. is 3 ft. square?

8. What per cent of $800 is $\frac{1}{8}\%$ of $8000?

9. If you save 10 ¢ a day, how much will you save in a leap year?

10. If $\frac{7}{8}$ of a barrel of flour is worth $5.60, how much are 2 bbl. worth?

Written.

1. Add: 85432, 76965, 34876, 98764, 57657, 68973, 87654 and 29876.

2. What number must be divided by $\frac{3}{7}$ of $2\frac{1}{8} \times 4$ to make a quotient equal to the value of $6\frac{2}{3} \times \frac{3}{20}$ of 6?

3.ˈ Two speculators buy 3240 A. of land and divide it so that one has .37½ and the other .62½ of it. How many acres has each?

4. $(200 + .02 - \frac{1}{2}) \times .8\frac{1}{4} + (.8\frac{1}{4} - .12\frac{7}{10}) \times 5\frac{1}{5} = ?$

5. A grain dealer invested $6459 in wheat and 23 % of that amount in oats. How much did he invest in oats? in both?

6. Add : 847464
177654
480356
634219
382299
958183
766548

7. How much will 12500 shingles cost at $5.75 per M?

8. If I sell 7356 feet of boards for $110.34, what is the price per M?

9. The population of the United States in 1910, in round numbers, was 93000000. In France it was 39000000, and in Japan 55000000. What per cent of the population of the United States was that of each of the other countries?

10. If the estimated population of Asia was 950000000 people, and of this number 110000000 are Mohammedans, and 300000000 are Buddhists, what per cent of the whole number is each of these sects?

XIV

Oral.

Rapidly subtract :

$\frac{1}{2} - \frac{1}{3}$ $\frac{2}{3} - \frac{1}{4}$ $\frac{4}{5} - \frac{2}{3}$ $\frac{5}{6} - \frac{2}{3}$

$\frac{2}{3} - \frac{1}{2}$ $\frac{3}{4} - \frac{2}{3}$ $\frac{1}{3} - \frac{1}{6}$ $\frac{1}{2} - \frac{1}{5}$

$\frac{1}{2} - \frac{1}{4}$ $\frac{1}{3} - \frac{1}{5}$ $\frac{2}{3} - \frac{1}{6}$ $\frac{2}{3} - \frac{2}{5}$

$\frac{3}{4} - \frac{1}{2}$ $\frac{2}{3} - \frac{1}{5}$ $\frac{5}{6} - \frac{1}{3}$ $\frac{4}{5} - \frac{1}{2}$

1. A farmer who had 150 sheep, sold 20 % of them. How many had he left?

2. A train of cars running 24 mi. an hour increases its speed $12\frac{1}{2}\%$. How far does it then run in an hour?

3. If $6 is paid for the use of $30 for a year, what is the rate per cent?

4. In a school with 2500 pupils registered the average attendance is 1750. What is the per cent of attendance?

5. If 300 lb. of charcoal are required to make a ton of gunpowder, what per cent of gunpowder is charcoal?

Rapidly subtract:

$\frac{1}{4} - \frac{1}{5}$	$\frac{1}{4} - \frac{1}{6}$	$\frac{1}{4} - \frac{1}{8}$	$\frac{7}{8} - \frac{1}{4}$
$\frac{2}{5} - \frac{1}{4}$	$\frac{3}{4} - \frac{1}{6}$	$\frac{3}{4} - \frac{1}{8}$	$\frac{7}{8} - \frac{3}{4}$
$\frac{3}{5} - \frac{1}{4}$	$\frac{5}{6} - \frac{1}{4}$	$\frac{3}{4} - \frac{3}{8}$	$\frac{1}{3} - \frac{1}{9}$
$\frac{4}{5} - \frac{1}{4}$	$\frac{5}{6} - \frac{3}{4}$	$\frac{3}{4} - \frac{5}{8}$	$\frac{2}{3} - \frac{1}{9}$

6. In a class of 40 pupils 20% were absent. How many were absent and how many were present?

7. A regiment took 960 horses into battle. If $8\frac{1}{3}\%$ were killed or injured, how many remained fit for use?

8. A boy earned $15, which was 20% of what he had before. How much has he now?

9. If 4 qt. of wheat are given as a toll for grinding a bushel, what per cent is the cost of grinding?

10. A parlor is 18 ft. wide and 24 ft. long. How many square yards does the floor contain?

Written.

1. A man receives a salary of $2400 a year. He pays 18% for board, $8\frac{1}{3}\%$ for clothing, and 16% for incidentals. How much are his yearly expenses, and how much can he save?

2. Mr. Watson had \$5420 in the bank. He drew out 15 % of it, then 20 % of the remainder, and afterwards deposited 12½ % of what he had drawn. How much did he have then in the bank?

3. A man who had \$3200, paid out 6¼ % for a building lot, and invested the balance in a house. How much did the house cost?

4. 2 yd. 2 ft. 3 in. equals how many per cent of 4 rd. ?

5. A lady paid \$750 for a piano, which was ¾ of her salary for a year. How much was her salary ?

6. At \$9.25 per C. how much will 5794 paving stones cost for a village sidewalk ?

7. A merchant bought goods for \$10000 and sold them at a gain of 2½ %. How much did he receive for them ?

8. Mr. Hamlin sold 360 A. of land, which was 33⅓ % of what he had at first. How many acres had he before he sold any ? How many acres had he left?

9. A man who failed in business had \$3350 cash, which just paid 67 % of his debts. How much did he owe ?

10. \$3.20 is what per cent of \$2000?

XV

Oral.

Rapidly multiply :

½ × ⅔	½ × ⅘	¾ × ⅘	¾ × ⅓
⅓ × ¾	⅓ × ⅗	⅔ × ⁶⁄₇	¾ × ⅘
⅔ × ¾	⅔ × ⅗	⅔ × ⅝	¾ × ⅛⁄₉

1. Read the following with the per cent sign :

.875 ; ⅜ ; 1.83⅓ ; .0525 ; .05125 ; .75375 ; 2.50 ; .005.

2. A farmer who had raised 800 bu. of corn, sold $37\frac{1}{2}\%$. How many bushels did he keep?

3. A man when asked how many geese and turkeys he had, replied that he had 150 geese and that the number of turkeys was 20 % less. How many turkeys had he?

4. If $2000 is 25 % of the amount of money I paid for a farm, how much did the farm cost me?

5. What per cent of 2 bu. is 4 qt.?

Rapidly multiply:

$\frac{1}{5} \times \frac{1}{2}$	$\frac{1}{6} \times \frac{6}{7}$	$\frac{2}{7} \times \frac{7}{8}$	$\frac{10}{12} \times \frac{4}{5}$
$\frac{2}{5} \times \frac{1}{3}$	$\frac{3}{6} \times \frac{12}{9}$	$\frac{4}{7} \times \frac{3}{4}$	$\frac{16}{5} \times \frac{10}{4}$
$\frac{3}{5} \times \frac{1}{6}$	$\frac{5}{6} \times \frac{3}{10}$	$\frac{4}{7} \times \frac{3}{8}$	$\frac{21}{7} \times \frac{7}{9}$

6. What per cent of a pound is 14 ounces?

7. A man's income is $1800 a year, of which he pays 20 % for rent. How much rent does he pay?

8. Thirty-six men of a ship's crew died, which was $42\frac{6}{7}\%$ of the crew. How many were in the crew?

9. What per cent of $6 is 9 dimes?

10. If $\frac{3}{4}$ of a bushel of corn costs 45¢, how much will $5\frac{1}{2}$ bu. cost?

Written.

1. I bought 150 bbl. of flour at $6.75 a barrel and sold them all at an advance of $12\frac{1}{2}\%$. How much money did they bring?

2. A man who owned $\frac{3}{4}$ of a machine shop worth $10000, sold $16\frac{3}{4}\%$ of his share to his brother. What part of the whole shop did he retain, and what was its value?

3. I shot 12 pigeons, which was $2\frac{2}{3}\%$ of the flock. How many escaped?

4. A stock farmer sold 144 sheep, which were $12\frac{1}{2}\%$ of his flock.   How many had he?

5. A man drew 25% of his bank deposits and spent $33\frac{1}{3}\%$ of the money thus drawn in the purchase of a horse worth $250.   How much money had he in the bank at first?

6. A man had $8750 in the bank, and drew out 8% of it at one time, and then 10% of the remainder.   How much had he left on deposit?

7. What per cent of 2 gal. 2 qt. is 9 gal.?

8. A father gave his son $30 as a birthday present, which was 6% of the sum he gave his daughter.   How much did he give his daughter?

9. How much will $\frac{3}{4}$ of a ton of plaster cost if 3000 lb. cost $4\frac{1}{2}$?

10. If a man who owns 45% of a steamboat sells $16\frac{2}{3}\%$ of his share for $5860, what is the value of the whole boat.

XVI

Oral.

Rapidly divide:

$2 \div \frac{1}{2}$	$\frac{1}{4} \div 2$	$\frac{1}{2} \div \frac{1}{4}$	$1\frac{1}{2} \div \frac{3}{4}$
$4 \div \frac{1}{3}$	$\frac{3}{4} \div 6$	$\frac{1}{2} \div \frac{5}{6}$	$2\frac{1}{2} \div \frac{5}{6}$
$4 \div \frac{2}{3}$	$\frac{2}{3} \div 4$	$\frac{2}{3} \div \frac{4}{5}$	$\frac{4}{5} \div 1\frac{1}{3}$
$6 \div \frac{3}{4}$	$\frac{3}{4} \div 3$	$\frac{3}{4} \div \frac{3}{5}$	$\frac{6}{7} \div 1\frac{1}{5}$

25 is $\frac{1}{4}$ of what number?   25 is $\frac{1}{4}$ more than what number?

Tell how to find a number when a fractional part of it is given; when a fractional part *more* than the number is given; when a per cent more than the number is given.

16 is $.33\frac{1}{3}$ of what number?   16 is $.33\frac{1}{3}$ more than what number?

35 is 25% of what number?   35 is 25% more than what number?

1. John had $35\cancel{c}$, which was $16\frac{2}{3}\%$ more than George had.   How much had George? *

2. A dealer paid $320 for a carriage, which was $14\frac{2}{7}\%$ more than he paid for a horse.   How much did he pay for the horse?

3. Reuben has 20 apples, which is 25% more than Clifford has.   How many has Clifford?

4. A lot was sold for $600, which was 200% more than it cost.   How much did it cost?

5. From a hogshead of molasses (63 gal.) $66\frac{2}{3}\%$ was drawn.   How many gallons remained?

———

Rapidly divide:

$3 \div \frac{3}{4}$	$\frac{2}{3} \div \frac{1}{2}$	$\frac{3}{4} \div 6$	$1\frac{1}{3} \div 4$
$5 \div \frac{1}{2}$	$\frac{4}{5} \div \frac{2}{5}$	$\frac{2}{3} \div 8$	$6 \div 1\frac{1}{2}$
$4 \div \frac{2}{5}$	$\frac{3}{4} \div \frac{6}{7}$	$\frac{3}{5} \div 9$	$1\frac{1}{4} \div \frac{5}{8}$
$6 \div \frac{2}{3}$	$\frac{3}{4} \div \frac{9}{8}$	$\frac{4}{5} \div 8$	$\frac{4}{5} \div 1\frac{1}{4}$

6. A man paid $18 for a saddle, which was $12\frac{1}{2}\%$ more than its value.   What was its value?

7. A grocer sold flour for $8.40 a barrel, which was $16\frac{2}{3}\%$ more than he paid for it.   How much did he pay for it?

* SUGGESTED EXPLANATION: Since John had $16\frac{2}{3}\%$, or $\frac{1}{6}$ more than George, and George had $\frac{6}{6}$ of his own money, they had together $\frac{6}{6} + \frac{1}{6}$, or $\frac{7}{6}$, of George's money.   Therefore $\frac{7}{6}$ of George's money = 35$\cancel{c}$.   Hence $\frac{1}{6}$ of George's money = $\frac{1}{7}$ of 35$\cancel{c}$, and $\frac{6}{6}$ of George's money = $\frac{6}{7}$ of 35$\cancel{c}$.

8. What number increased by 25 % of itself amounts to $60 ?

9. If A can do a piece of work in 2 days, and B in 3 days, how long will it take them working together ?

10. One pipe will fill a cistern in 4 hr. ; a second pipe will fill it in 5 hr. How long will it take both to fill the cistern ?

Written.

1. The number of pupils enrolled in the schools of a certain town is 1161, which is 35 % more than the number in attendance. How many are there in attendance ?*

2. What amount of money increased by 35 % of itself equals $168.75?

3. What number increased by $8\frac{1}{3}$ % of itself is 130?

4. A general lost $16\frac{2}{3}$ % of his army, 315 having been killed, 110 having been taken prisoners, and 70 having deserted. How many men were there in the army ?

5. Find the cost of 234 boards each 14 ft. long, 8 in. wide, at $3.25 per C board feet.

-----

6. What number increased by 8 % of itself equals 243 ?

7. I bought a watch for $81, which was 8 % more than its value. What was its value?

8. A carriage was sold for $299, which was 15 % more than its value. What was its value ?

* SUGGESTED METHOD : $\dfrac{\text{Amount}}{100\% + \text{Rate}\%} = \text{Base.}$

Amount $\begin{cases} \text{Base} & 100\% \text{ or } \frac{20}{20}. \\ \text{Rate} & 35\% \text{ or } \frac{7}{20}. \end{cases}$

1161　　　= 135% or $\frac{27}{20}$ of the attendance.

9. Find how many per cent $5.12 is of $640.

10. A man has an annual income of $2550. He spends 15 % in traveling, 20 % for board, and $6\frac{1}{2}$ % for clothing. How much does he save?

XVII

Oral.

Rapidly answer:

3.55 ÷ 5	18 ÷ .3	1.20 ÷ .4	.126 ÷ 7
3.06 ÷ 6	25 ÷ .05	1.20 ÷ .04	.126 ÷ .7
37.8 ÷ 9	24 ÷ .4	1.25 ÷ .5	.126 ÷ .07
3.15 ÷ 3	28 ÷ .07	1.25 ÷ .05	12.6 ÷ .007

Tell how to find the base when the amount and rate are given. The amount is $60, the rate is 20 %; find the base.

1. What number increased by 25 % of itself equals 100?

2. A boy had 40¢, which was 25 % more than his brother had. How much had his brother?

3. A man's salary this year is $54 a week, which is 20 % more than it was last year. How much was it last year?

4. If a boy earns $$\frac{4}{5}$ a day, how long will it take him to earn $6?

5. Divide .42 by 2.1.

Rapidly answer:

6 ÷ .3	1.2 ÷ 4	48 ÷ .6	24 ÷ 10
.6 ÷ .3	1.2 ÷ .4	4.8 ÷ .06	2.4 ÷ 20
.06 ÷ .3	.12 ÷ .4	.48 ÷ .006	.24 ÷ 200
.06 ÷ .03	1.2 ÷ .04	4.8 ÷ 60	.024 ÷ 200

6. What number increased by 25 % of itself amounts to $60?

7. From a hogshead (63 gal.) of molasses $33\frac{1}{3}$ % was drawn. How many gallons remained?

8. What per cent of $25 is $$\frac{1}{4}$?

9. Forty is $\frac{1}{2}$ % of what number?

10. A cask containing 28 gal. 3 qt. lost 5 gal. 3 qt. by leakage; what per cent leaked out?

Written.

1. Add: 746637
926483
618752
384949
593186
876543
445566

2. The annual report of a telegraph company for one year was as follows: Gross earnings $33889202, operating expenses, including taxes, $26614302, interest on bonds, $168782̣9.73, dividends on stock, $2989696.50. How much was the balance?

3. A woman can buy a shirtwaist for $3.98, or she can make it at the following cost for material: $2\frac{1}{2}$ yd. linen at 30¢ a yard, 4 yd. lace at 25¢ a yard, 10 buttons at 60¢ a dozen, and 10¢ worth of thread. How much will she save if she makes the waist herself? If she should buy the materials and pay $1.50 for making it, would she save, and if so, how much?

4. If the wages of a certain class of workmen are to be raised 15 % from their present scale, which is $1.80 per day, how much will the wages be under the new scale? How much more will the increase give a man who works 250 da.?

5. A speculator gained 19 % of his capital and then had $3808. How much had he at first?

---

6. Add: 291829
843962
739872
385746
597835
458953
622384

7. A stock dealer who had $2800, spent $14\frac{2}{7}$ % of it for sheep, $37\frac{1}{2}$ % of the remainder for cattle, and the remainder for mules, at $60 per head. How many mules did he buy?

8. In a recent year, the telephone companies of the United States employed 14124 people, at a total annual salary of $9885886. How much was the average salary?

9. From a 5 gal. can of kerosene I filled a tank holding 1 gal. 1 qt. 1 pt., a lamp holding 1 qt. 1 pt., and 2 other lamps holding $\frac{3}{4}$ pt. each. How much kerosene remained in the tank?

10. Simplify: $\dfrac{\frac{2}{9}}{\frac{1}{2} \text{ of } \frac{1}{3}} \div \dfrac{\frac{3}{4} \text{ of } .6}{4.2}$.

XVIII

Oral.

Rapidly find the base :

Amount	Rate	Amount	Rate	Amount	Rate
60	20 %	24	20 %	100	$11\frac{1}{8}$ %
50	25 %	36	$33\frac{1}{3}$ %	120	20 %
90	$12\frac{1}{2}$ %	25	25 %	150	50 %
54	$12\frac{1}{2}$ %	30	25 %	200	$33\frac{1}{3}$ %

If 24 is $\frac{1}{4}$ less than a number, how many fourths of the number is 24? What is the number?

If 20 is .20 less than a certain number, how many hundredths or what fractional part of the number is 20 ?

If 25 is 75 % less than a certain number, what per cent of the number is 25 ?   What is the number?

Tell how to find a number when a per cent less than the whole of it is given.

1. A bicycle was sold for $50, which was $16\frac{2}{3}$ % less than it was worth.   How much was it worth?

2. A dealer sold a sleigh for $24, which was 20 % less than its value.   What was its value ?

3. What number diminished by 20 % of itself equals 40 ?

4. What number increased by 20 % of itself equals 24 ?

5. If $\frac{3}{5}$ of a yard of cloth costs $\$\frac{9}{10}$, how much will 5 yd. cost ?

Rapidly find the base :

Amount	Rate	Amount	Rate	Amount	Rate
48	20 %	45	$12\frac{1}{2}$ %	54	$12\frac{1}{2}$ %
32	$14\frac{2}{7}$ %	22	10 %	16	$33\frac{1}{3}$ %
42	20 %	42	$16\frac{2}{3}$ %	28	$16\frac{2}{3}$ %
27	$12\frac{1}{2}$ %	55	$37\frac{1}{2}$ %	80	25 %

6. A farmer sold a cow for $60, which was 25 % less than he paid for it.   How much did he pay for it ?

7. My money diminished by 25 % of itself equals $33. How much money have I ?

8. A merchant buys lead pencils at the rate of $\frac{1}{2}$ ¢ each, and sells them at the rate of 3 ¢ each.   How much does he make on the sale of a dozen pencils?

9. A man is 72 yr. old, and $12\frac{1}{2}$ % of his age is 25 % of his son's age. What is the son's age?

10. Four fifths of 20 is $\frac{2}{3}$ of how many?

Written.

1. A man after paying $62\frac{1}{2}$ % of his debts, finds that $4500 will pay the remainder. How much was his whole debt?

2. A man sold a farm for $7000, which was $12\frac{1}{2}$ % less than its value. What was its value?

3. I spent $42\frac{6}{7}$ % of my money, and had left $2. How much had I at first?

4. A man sold a farm for $7000, which was $16\frac{2}{3}$ % more than the value. What was the value?

5. What is $12\frac{1}{2}$ % of 8 bu. 5 qt.?

6. A drew out of the bank 40 % of 50 % of 60 % of 70 % of his money and had left $1557.20. How much money had he at first?

7. The population of a town increased in 10 years 72 %. In 1870 its population was 11180. How much was it in 1860?

8. What number diminished by $\frac{2}{5}$ and $\frac{3}{7}$ of itself leaves a remainder of 480?

9. A and B each invest $3300 in business. At the end of a year A has gained 12 % and B has lost $5\frac{1}{4}$ %. How much has each then?

10. How many cords of wood can you put in a barn 40 ft. by 30 ft. by $13\frac{1}{3}$ ft.?

XIX

Oral.

Rapidly find the base:

Diff.	Rate	Diff.	Rate	Diff.	Rate
24	20%	56	$12\frac{1}{2}\%$	36	40%
30	$14\frac{2}{7}\%$	35	$16\frac{2}{3}\%$	45	$37\frac{1}{2}\%$
36	25%	81	10%	28	30%
42	$12\frac{1}{2}\%$	27	25%	42	$22\frac{2}{9}\%$

Read as hundredths: $1\frac{1}{2}\%$; $2\frac{1}{2}\%$; $\frac{1}{4}\%$; $\frac{1}{2}\%$.

1. Joseph sold 60 sheep, which was $16\frac{2}{3}\%$ less than the number in his flock. How many were in his flock?

2. A farmer raised 800 bu. of barley and 25% more bushels of wheat. How many bushels of both did he raise?

3. If $\frac{1}{2}$ of a pound of tea costs $60\cancel{c}$, how much will $\frac{1}{4}$ of a pound cost? How much will 3 lb. be worth?

4. If 25% of a crop of oats is sold for $50, how much is the entire crop worth?

5. Change $4\frac{3}{4}$ min. to seconds.

Rapidly find the base:

Diff.	Rate	Diff.	Rate	Diff.	Rate
25	$16\frac{2}{3}\%$	27	40%	15	40%
55	$8\frac{1}{3}\%$	42	$62\frac{1}{2}\%$	27	10%
30	$6\frac{1}{4}\%$	48	$14\frac{2}{7}\%$	36	20%
45	$37\frac{1}{2}\%$	56	$11\frac{1}{9}\%$	28	20%

6. What per cent of 10 gal. is 3 qt.?

7. A who owes B some money, hands him a $10 bill, and says: "There is $6\frac{1}{4}\%$ of your money." How much is the debt?

8. A man who owned $\frac{3}{8}$ of a ship sold 40 % of his share. What part of the ship did he sell? What part did he still own?

9. Six is what per cent of $4\frac{1}{2}$?

10. Four ounces is 5 % of how many pounds (avoir.)?

Written.

1. A man pays $13 a month for board, which is 20 % of his salary. How much is his salary a year?

2. A boy lost $3, which was $31\frac{1}{4}\%$ of what he had left. How much had he at first?

3. I found $5, which was $13\frac{1}{8}\%$ of what I had before. How much had I at first?

4. I drew 48 % of my funds in bank to pay a note of $150. How much had I left?

5. I bought 8000 bu. of wheat, which was $57\frac{1}{7}\%$ of my whole stock. How much had I before?

---

6. I paid 40¢ for the putting in of 25 bu. of coal, which was $11\frac{3}{7}\%$ of its cost. What was the cost per bushel?

7. If $25 was $62\frac{1}{2}\%$ of A's money and $41\frac{2}{3}\%$ of B's money, how much did each have?

8. What is 180 % of $4\frac{3}{5}$?

9. What is $\frac{5}{8}\%$ of 1800?

10. If $\frac{1}{2}$ of a yacht costs $3840\frac{1}{2}$, what is the value of $\frac{3}{4}$ of it?

XX

Oral.

Rapidly find the terms marked " ? " : *

Base	Rate	Percentage	Am't	Diff.
$200	?	?	$250	?
$600	20 %	?	?	?
?	12½ %	$40	?	?
?	20 %	?	$300	?
?	40 %	?	?	$150

1. What is $\frac{6}{7}$ % of $14?

2. A merchant bought hats at $36 per dozen, and sold them at an advance of $16\frac{2}{3}$ %. How much did he receive for each hat?

3. If $87\frac{1}{2}$ % of a barrel of flour is worth $5.60, how much is the whole barrel worth?

4. A man sold a wagon for $60, which was $37\frac{1}{2}$ % less than he paid for it. How much did he pay for it?

5. If $2\frac{1}{2}$ yd. of silk cost $5, how much do I have to pay for $7\frac{1}{2}$ yd.?

Rapidly find the term marked " ? " :

Base	Rate	Percentage	Am't	Diff.
$24	12½%	?	?	?
$30	?	$5	?	?
$27	?	?	$36	?
$40	?	?	?	$36
?	20 %	$7	?	?

* NOTE : In the examples where the base is missing, first find the base. Then all the missing terms may be readily found.

6. Find $\frac{5}{6}$ % of 1200 ft.

7. How much is gained by selling a farm that cost $3200 at a profit of 25 % ?

8. What is 105 % of $30 ?

9. A miller takes as payment 2 qt. of every bushel of grain he grinds. What per cent does he take?

10. What number increased by $8\frac{1}{3}$ % of itself is 130 ?

Written.

1. A commander who had an army of 16293 men, lost $33\frac{1}{3}$ % of them by sickness and desertion. How many men remained ?

2. Two thirds is how many per cent of $\frac{4}{5}$?

3. This year I pay $377 rent, which is 16 % more than I paid last year. How much did I pay last year?

4. A man's age is 28 years, which is $14\frac{2}{7}$ % less than his brother's age. How old is his brother ?

5. If $\frac{7}{8}$ of an acre of land costs 122\frac{1}{2}$, how much will $2\frac{4}{5}$ acres cost ?

6. A farmer who owned 3560 sheep, lost 50 % of them and sold 25 % of the remainder. How many had he left ?

7. $\dfrac{2\frac{1}{2}}{3}$ is what per cent of $\dfrac{3\frac{3}{4}}{10}$?

8. I sold a carriage for $633, which was $5\frac{1}{2}$ % more than I paid for it. How much did I pay for it ?

9. A clerk spent 25 % of his salary for board, 15 % for books, $12\frac{1}{2}$ % for clothing, and saved $712.50. How much was his salary ?

10. The difference between $\frac{5}{9}$ and $\frac{3}{7}$ of the value of an estate is $2432. What is $\frac{1}{3}$ of $\frac{1}{2}$ of it worth ?

SECOND MONTH

RAPID DRILLS — daily.

THE FUNDAMENTAL OPERATIONS — to secure quickness and accuracy.

COMMON FRACTIONS — reviewed.

DECIMAL FRACTIONS — reviewed.

DENOMINATE NUMBERS — reviewed.

TABLES — reviewed.

BILLS — reviewed.

PERCENTAGE — reviewed.

PROFIT AND LOSS. Finding the gain or loss and the selling price, when the cost and the rate are given.

Finding the rate of gain or loss, when the cost or the selling price and the gain or the loss is given.

Finding the cost when the gain or the loss or the selling price and the rate are given.

MARKED PRICE.

PROBLEMS. To cover the work of the month in common and decimal fractions, tables, percentage, profit and loss, and the type problems.

XXI

Oral.

Rapidly find the results :

42 + 38	83 − 65	26 × 3	860 ÷ 10
76 + 49	84 − 53	23 × 4	320 ÷ 20
84 + 53	82 − 52	18 × 5	480 ÷ 30
97 + 65	59 − 55	16 × 6	560 ÷ 40
83 + 46	88 − 29	20 × 7	250 ÷ 50
96 + 43	45 − 16	15 × 8	375 ÷ 50

93 + 75	96 − 38	23 × 9	418 ÷ 20
79 + 76	97 − 51	46 × 2	324 ÷ 30
90 + 39	98 − 44	32 × 3	456 ÷ 40
88 + 45	47 − 36	34 × 4	636 ÷ 60

7 × 8, − 1, + 11, × 9, − 3, ÷ 6, × 7, + 21 ÷ 7 = ?

If a dealer gains $5 on every $100 worth, what is his rate of gain? If a dealer loses $6 on every $100 worth, what is his rate of loss? Name the terms used in Profit and Loss. Which term in Percentage corresponds to the **cost** in Profit and Loss? to the **selling price**? to the **gain** or the **loss**? In estimating his gains or losses, what does the merchant *always* consider as the base?

1. A merchant buys flour at $5 a barrel and sells it so as to gain 20 %. How much does he gain?

2. A grocer buys eggs at 36¢ a dozen and sells them so as to gain 33⅓ %. For how much does he sell them? *

3. How much money is lost by selling goods that cost $24 at a loss of 12½ % ?

4. A book that cost $4 was sold at a loss of 25 %. What was the selling price? †

5. What is ¼ % of $120?

_____

Rapidly find the results:

87 + 32	52 − 28	65 × 2	87 ÷ 3
71 + 61	77 − 66	48 × 3	64 ÷ 4
82 + 16	68 − 25	64 × 4	75 ÷ 5
67 + 45	97 − 51	29 × 5	84 ÷ 6

* SUGGESTED EXPLANATION :

$\qquad$ Cost $\quad$ Gain $\quad$ S. P.

$33\frac{1}{3}\% = \frac{1}{3}$ $\quad$ ⅓ of C. + ⅓ of C. = ⅓ of C. ; ⅓ of 36¢ = ?

$\qquad$ Cost $\quad$ Loss $\quad$ S. P.

† 25 % = ¼ $\quad$ ¼ of C. − ¼ of C. = ¼ of C. ; ¼ of $4 = ?

67 + 64	71 − 67	14 × 6	98 ÷ 7
87 + 64	47 − 36	17 × 7	96 ÷ 8
67 + 28	84 − 28	18 × 8	63 ÷ 9
98 + 44	75 − 57	16 × 9	56 ÷ 10
96 + 38	42 − 27	48 × 2	86 ÷ 20
27 + 18	59 − 16	57 × 3	42 ÷ 30

8 × 9, + 3, ÷ 15, × 6, + 2 + 8, × 7, − 1, + 3 = ?

6. How much does a grocer make by selling at 20 % profit flour that cost $6 ?

7. I bought corn at 40¢ a bushel and sold it to gain 12½ %. How much did I get for it?

8. A merchant bought a bolt of goods at $1.50 a yard. He sold it at a loss of 40 %. For how much did he sell it?

9. If in a school of 276 pupils 66⅔ % are boys, how many boys are there in the school?

10. A milkman buys milk at 15¢ a gallon, and sells it at 7¢ a quart. How much does he make on a 10-gal. can?

Written.

1. A dealer bought goods for $850 and sold them at a profit of 15 %. How much did he gain?

2. An automobile that cost $750 was sold at a gain of 20%. For how much was it sold? *

3. A piano that cost $450 was sold at a loss of 12 %. What was the selling price? †

---

* SUGGESTED STATEMENT : Cost × (100 % + G. %) = S. P.

$$750 × ⅚ = ?$$

† Cost × (100 % − L. %) = S. P.

$$450 × 88 % = ?$$

4. Coffee that has been bought for 28 ¢ a pound is sold at a loss of $2\frac{1}{2}$ %. Find the selling price of 10 lb.

5. At $3.50 a cord, what is the value of a pile of wood 4 ft. wide, 64 ft. long, and 7 ft. high ?

---

6. Flour that cost $6.84 per barrel was sold at a gain of $16\frac{2}{3}$ %. For how much per barrel was it sold ?

7. A merchant bought gloves at $15 a dozen. For how much a pair must he sell them to lose 20 % ?

8. If a man starts in business with $8000 capital and gains 19 % in a year, how much will he have at the close of the year ?

9. Mr. Brown paid $196 for a piece of silk containing 50 yd. For how much per yard must he sell it to gain 25 % ?

10. What number increased by 20 % of itself equals 360 ?

XXII

Oral.

Rapidly find the results :

$\frac{2}{3} + \frac{3}{4}$	$1 - \frac{3}{8}$	$\frac{8}{9} \times 6$	$1 \div \frac{3}{8}$
$\frac{5}{6} + \frac{2}{3}$	$\frac{7}{8} - \frac{3}{4}$	$16 \times \frac{7}{8}$	$6 \div \frac{3}{8}$
$\frac{3}{8} + \frac{1}{6}$	$\frac{8}{9} - \frac{2}{3}$	$\frac{3}{4} \times \frac{5}{6}$	$\frac{4}{5} \div 2$
$\frac{1}{2} + \frac{5}{8}$	$\frac{4}{5} - \frac{1}{2}$	$1\frac{1}{2} \times \frac{2}{3}$	$\frac{4}{5} \div \frac{3}{4}$
$\frac{3}{4} + \frac{5}{12}$	$\frac{3}{4} - \frac{1}{3}$	$\frac{3}{4} \times 1\frac{1}{3}$	$\frac{5}{6} \div \frac{5}{8}$

Tell how to find the gain or loss in money when the cost and the rate of gain or loss are known.

Tell how to find the selling price when the cost and the rate of gain are known.

Tell how to find the selling price when the cost and the rate of loss are known.

1. A boy paid \$40 for a bicycle and sold it to gain 5 %. How much did he receive for it?

2. What must be the selling price of goods that cost 68¢ a yard, so that a profit of 25 % may be made?

3. A profit of 12½ % is made on lard costing 8¢ a pound. Find the selling price.

4. Three quarters of a peck of oats is what per cent of a bushel?

5. If ¾ of a yard cost \$⅔, how much will 2 yd. cost?

Rapidly find the results:

$\frac{8}{9} + \frac{2}{3}$	$\frac{7}{9} - \frac{2}{3}$	$\frac{5}{6} \times \frac{4}{5}$	$1 \div \frac{4}{5}$
$\frac{5}{6} + \frac{3}{4}$	$\frac{5}{6} - \frac{3}{4}$	$\frac{4}{5} \times \frac{3}{4}$	$8 \div \frac{4}{5}$
$\frac{1}{4} + \frac{3}{8}$	$\frac{3}{8} - \frac{1}{4}$	$\frac{2}{3} \times \frac{6}{7}$	$\frac{2}{3} \div 6$
$\frac{1}{8} + \frac{7}{24}$	$\frac{5}{12} - \frac{1}{3}$	$\frac{5}{8} \times \frac{2}{3}$	$\frac{2}{3} \div \frac{4}{5}$
$\frac{5}{8} + \frac{3}{4}$	$\frac{7}{8} - \frac{1}{2}$	$\frac{7}{12} \times \frac{6}{7}$	$1\frac{1}{2} \div 1\frac{1}{5}$

6. A man bought a horse for \$160. He sold it at a gain of 25 %. What was the selling price?

7. Of a farm consisting of 320 A., 80 A. are planted in hay. What per cent of the farm is in hay?

8. A dealer sold a cow which cost him \$32 at a profit of 25%. What was his selling price?

9. What per cent of a gallon is 1.6 pt.?

10. What is ⅘ % of \$25?

Written.

The figures to the right of each state represent the number of cotton bales ginned in a certain year according to the Census Bureau Report.

1. United States 11313236 bales
   Alabama 1239211 bales
   Georgia 2106305 bales
   Louisiana 269548 bales
   Mississippi 719638 bales
   So. Carolina 1163984 bales
   Texas 3473702 bales

(*a*) How many bales were ginned in all other states not mentioned?

(*b*) What per cent of the entire amount was ginned in Mississippi? in Georgia?

(*c*) How many more bales were ginned in Georgia than in Louisiana? in Texas than in Georgia?

(*d*) What per cent more was ginned in Mississippi than in Louisiana?

2. At what price must cloth that cost $2.75 a yard be sold to gain 24 %?

3. A hogshead of sugar weighing 8 cwt. 76 lb. costs $61.32, and $8.76 is paid for freight and cartage. At what price per pound must it be sold to gain 12½ %?

4. If 75 yd. of cloth cost $225, at what price per yard must it be sold to gain 10 %?

5. A man owning ⅝ of an iron mine sold 37½ % of his share for $25600. What part did he then own and what is its value?

6. Add the following numbers in columns and across ·the page.   Then add and compare the results :

$2548.67	$ 694.39	$ 87.	?
925.	5863.87	8.49	?
97.88	876.99	4897.	?
86.	685.18	9927.87	?
8.75	7849.47	69.81	?
? +	· ? +	. ? =	?

7. A dealer bought coal at $3.75 a ton, which he sold at an advance of 20 %.   What was the selling price ?

8. A man whose height is 5 ft. $8\frac{1}{2}$ in., has a son who is 30 % less in height.   What is the height of the son ?

9. When gold is at a premium of $12\frac{1}{2}$ %, what is the value in gold of $1.00 in currency ?

10. If $\frac{3}{4}$ of a pound of tea costs 45¢, how much will $16\frac{3}{4}$ lb. cost?

XXIII

Oral.

Rapidly find the results :

$\frac{8}{10} + \frac{3}{100}$	$\frac{7}{10} - \frac{2}{100}$	$\frac{3}{10} \times \frac{2}{10}$	$\frac{5}{10} \div \frac{2}{10}$
$\frac{5}{10} + \frac{8}{1000}$	$\frac{2}{10} - \frac{8}{1000}$	$\frac{8}{10} \times \frac{5}{100}$	$\frac{8}{10} \div \frac{4}{100}$
.06 + .8	.05 − .005	.8 × .3	.5 ÷ 100
.005 + .7	.2 − .08	.7 × .04	.6 ÷ .02
.07 + .09	.29 − .2	.02 × .06	60 ÷ .02

A gain of $4 on $20 is a gain of how many dollars on $100? $6 on $30? $5 on $20? $8 on $32?

What per cent of gain is a gain of $4 on $16? $5 on $10?

What per cent of loss is a loss of $2 on $12? $4 on $28?

1. What per cent does a man gain who pays $200 for a wagon and sells it for $40 more?

2. If I pay $4 for an article and sell it for $5, what per cent do I gain?

3. If I pay $5 for an article and sell it for $4, what per cent do I lose?

4. If I pay 3¢ for a pad and sell it for 5¢, what per cent do I gain?

5. If I pay 5¢ for a pad and sell it for 3¢, what per cent do I lose?

Rapidly find the results :

8.2 + 3.4	1.2 — .04	2.4 × 6	2.8 ÷ 7
.24 + .2	2.05 — .2	3.2 × 8	3.2 ÷ 80
.15 + .02	3.4 — .005	1.2 × 9	.48 ÷ 6
.8 + .123	1.2 — .08	.24 × 2	18 ÷ .6
.25 + .4	2 — .004	.18 × 5	24 ÷ .04

6. What is my gain per cent, if I buy for $6 and sell for $7?

7. What per cent do I lose by buying goods for $7 and selling them for $6?

8. What is the selling price of coal costing $4.20 a ton and selling at a gain of 25 %?

9. Forty is 12½ % of what number?   ⅛ %?

10. What is the area of a rectangle whose base is 8 in. and whose altitude is 6 in.?

Written.

1. I sold for $6.20 a quantity of goods that cost me $5.   What was the gain per cent? *

* SUGGESTED METHOD: $\frac{\text{G. or L.}}{\text{Cost}}$ = Rate. $6.20, S.P. $\frac{$1.20}{$5.00}$ = ? %
                                                    5.00, Cost
                                                    $1.20, G. in money

2. What per cent is gained by buying cloth at 75¢ a yard and selling it at 87½¢ a yard?

3. What per cent is lost by buying cloth at 87½¢ a yard and selling it at 75¢ a yard?

4. What per cent is gained by buying apples at $3.75 a barrel and selling them at $5 a barrel?

5. Find the value of 11 % of $180 + 22 % of $160 + 92 % of $63.

6. Tea that cost $1.20 is sold for $1.08. Find the loss per cent.

7. What per cent is gained by buying wheat for $1.32 a bushel and selling it for $1.50 a bushel?

8. Two reams of paper are bought for $3 a ream, and sold at 25¢ a quire. What is the gain or loss per cent?

9. A grocer bought 25 barrels of flour at $6.80 a barrel, and sold all at a gain of $51. What per cent was gained?

10. By what per cent of itself must 240 yd. be increased to equal 300 yd.?

XXIV

Oral.

Rapidly find:

16⅔ % of
$$\begin{cases} 120 \\ 240 \\ 600 \\ 720 \\ 840 \\ 960 \\ 360 \\ 480 \end{cases}$$
125 % of
$$\begin{cases} 200 \\ 160 \\ 120 \\ 240 \\ 720 \\ 480 \\ 360 \\ 420 \end{cases}$$
¼ % of
$$\begin{cases} 800 \\ 240 \\ 160 \\ 200 \\ 100 \\ 120 \\ 280 \\ 560 \end{cases}$$

1. If ⅔ of an estate is sold for what the whole of it cost, what is the gain per cent? *

2. If ⅔ of an estate is sold for what ½ of it cost, what is the loss per cent?

3. If a man sells an article for 4 times the cost, what per cent does he gain?

4. A merchant sold ⅝ of a barrel of beef for what the whole barrel cost. What per cent did he gain on the part sold?

5. At $¾ a pound, how many pounds of tea can be bought for $7½?

Rapidly find:

$$40\% \text{ of } \begin{cases} 120 \\ 150 \\ 350 \\ 175 \\ 280 \\ 400 \\ 840 \\ 750 \end{cases} \quad 133\tfrac{1}{3}\% \text{ of } \begin{cases} 270 \\ 120 \\ 150 \\ 900 \\ 870 \\ 240 \\ 360 \\ 480 \end{cases} \quad \tfrac{1}{8}\% \text{ of } \begin{cases} 1600 \\ 2400 \\ 3200 \\ 4000 \\ 1600 \\ 4800 \\ 6400 \\ 5600 \end{cases}$$

6. A man bought a bicycle for $40 and sold it for $30. How much did he lose? on what amount as a base? What per cent did he lose?

7. What per cent is gained on goods sold at double their cost? at one half more than the cost?

---

* If ¾ is sold for what all cost, ¼ will be sold for ½ of the cost and ¾ or all for 3 times ½ of the cost, which is ¾ of C. = S. P.

S. P.   Cost   Gain
¾ of C. — ¾ of C. = ½ of C. = ? %.

8. A real estate agent bought a house for $2500, and sold it for $3000. What was the rate of gain?

9. If milk is bought at 7¢ a quart and sold at 9¢ a quart, what is the rate of gain?

10. If A can do a piece of work in 5 days and B can do the same work in 6 days, how long will it take them if they work together?

Written.

1. If $\frac{4}{5}$ of an investment is sold for what $\frac{1}{2}$ of it cost, find the loss per cent.*

2. If I sell $\frac{3}{4}$ of an article for the cost of $\frac{1}{2}$, what per cent do I lose on the part sold?

3. If $\frac{1}{2}$ of an acre is sold for what $\frac{5}{8}$ of it cost, what per cent is gained?

4. If I pay $8\frac{1}{2}$¢ a yard for calico that I afterward sell for $12\frac{3}{4}$¢ a yard, what per cent do I gain?

5. A man bought peaches at $$\frac{3}{5}$ a basket, and sold them for 1\frac{1}{4}$ a basket. If he gained $52 in the transaction, how many baskets did he sell?

---

6. I sold a lot of damaged goods that cost me 84¢ a yard for 63¢ a yard. What was my loss per cent?

7. Mr. Thomas saves $31\frac{1}{4}$% of his income or $600. What is his income?

8. Mr. Morgan sold his house, which cost him $3680, at a loss of 5%. How much did he receive for it?

* SUGGESTED STATEMENT :   Cost   S. P.   Loss
$\frac{4}{5}$ of $\frac{1}{2}$ C. = $\frac{2}{5}$ C. = S. P. $\frac{4}{5}$ C. − $\frac{2}{5}$ C. = $\frac{2}{5}$ C, = ?%.

9. I bought $640 worth of English prints and sold them at a gain of 12%. What was the selling price?

10. How many yards of silk, ⅝ of a yard wide, will line cloth 23½ yd. long and 1¼ yd. wide?

XXV

Oral.

Rapidly find the per cent that

25 is of 30	12 is of 48	5 is of 200	60 is of 300
30 is of 45	24 is of 36	4 is of 800	50 is of 200
45 is of 50	14 is of 49	8 is of 160	45 is of 250
50 is of 75	20 is of 25	3 is of 120	30 is of 450

Tell how to find the rate when the base and the percentage are given; when the base and the amount are given; when the base and the difference are given; when the amount or the difference and the percentage are given.

Tell how to find the rate of gain or loss when the cost and the gain or loss are given; when the selling price and the cost are given; when the selling price and the gain or loss are given.

Give an example of each case, using your own figures, and then give the approximate answers.

1. A boy paid 85¢ for a knife and sold it to gain 20%. For how much did he sell it?

2. I bought an article for $1¼ and sold it for $3. What was my gain per cent?

3. Sixteen dollars is ⅔% of how many dollars?

4. If ¾ of an estate is sold for the cost of the whole estate, what per cent is gained?

5. How much will 2 quires and 12 sheets of paper cost at 20 ¢ a quire?

Rapidly find the per cent that

16 is of 24	$\frac{1}{2}$ is of 10	60 min. is of 1 hr.
24 is of 48	$\frac{1}{5}$ is of 20	6 in. is of 1 ft.
35 is of 35	$\frac{1}{4}$ is of 5	16 hr. is of 1 da.
15 is of 60	$\frac{1}{4}$ is of 25	3 pt. is of 1 gal.

6. What per cent of the money collected did James receive if he was paid $2 for collecting $20?

7. A merchant buys hammers at $1.25 each, and sells them at $1.50 each. What is the gain per cent?

8. A farmer who had 300 sheep sold $\frac{1}{4}$ of his flock to one man and 20 % of it to another. How many sheep remained?

9. A merchant buys gloves at wholesale at 75 ¢ a pair, and sells them at retail at a profit of $33\frac{1}{3}$ %. For how much does he sell them?

10. A man paid $75 for a watch and $\frac{2}{5}$ as much for a chain. How much did both watch and chain cost?

Written.

1. Mr. Johnson bought some hay for $560. For how much must he sell it to gain 15 %?

2. A knife that cost $1.20 was sold for $1.40. What was the per cent gained?

3. A bookkeeper spent $600 one year, which was 24 % of his salary. How much was his salary?

4. In a certain school 5 % of the pupils were absent one day, and the attendance was 570. How many pupils were on roll? How many pupils were absent?

5. How much will 56¼ lb. of butter cost if 252 lb. cost $84?

————

6. If my annual income is $3560 and I spend 25 % of it each year, how much can I save in 4 yr. ?

7. Forty is ½ % of what number?

8. If ¾ of a mill is worth $10000, how much is ½ of the remainder worth?

9. If a man spends $959 and has 30 % of his salary left, how much is his salary?

10. Find the cost of 17½ yd. of broadcloth if 14¼ yd. cost $21.37½.

XXVI
Oral.

Rapidly find the number of which

48 is 66⅔ %	28 is 87½ %	14 is ½ %	10 is 20 %
36 is 60 %	18 is 50 %	12 is ⅔ %	12 is 12½ %
20 is 33⅓ %	16 is 40 %	16 is ⅘ %	30 is 83⅓ %
15 is 37½ %	12 is 25 %	15 is ⅗ %	15 is 75 %

40 is ⅔ of what number? 42 is .75 of what number? 36 is 66⅔ % of what number? In an example like the last what name is given to the number to be found? What name is given to 36? to 66⅔ % ? Given the percentage and rate, tell how to find the base.

I gained 20 ¢ by selling a book at a gain of 25 %. How much did it cost me? In this example what name is given to 20 ¢? to 25 % ? to the answer? Given the gain or loss and the rate of gain or loss, tell how to find the base or cost.

1. A man gained $28 on a watch by selling it at a gain of 25%. How much did it cost?*

2. Find the cost of pork sold at $.50 per hundred-weight less than cost or at a loss of 10%.

3. How much does corn cost that is sold at 17¢ per bushel less than cost, or at a loss of 25%?

4. What is the price of tea that is sold for $12\frac{1}{2}$¢ a pound less than cost at a loss of $12\frac{1}{2}$%?

5. A man paid a debt of $75, which represented $62\frac{1}{2}$% of his money. How much money had he left?

Rapidly find the number of which

25 is $62\frac{1}{2}$%	36 is 75%	30 is 25%	200 is $\frac{1}{2}$%
18 is $16\frac{2}{3}$%	24 is 20%	12 is 15%	300 is $\frac{1}{3}$%
12 is 25%	60 is 80%	14 is 40%	400 is $\frac{1}{4}$%
30 is $16\frac{2}{3}$%	27 is 90%	15 is 25%	500 is $\frac{1}{5}$%

6. I gained $20 on a sleigh by selling it at an advance of 25%. How much did it cost me?

7. I burned 5 gal. of kerosene oil, or 25% of my supply, in a month. How many gallons had I at first?

8. What per cent is gained by buying molasses at 25¢ a gallon and selling it at 5¢ a pint?

9. What is $\frac{2}{7}$% of $28?

10. Robert worked 40 min. at the rate of $$\frac{3}{5}$ an hour. How much did he earn?

* Suggested Explanation: 25% = $\frac{1}{4}$. Since $28 = $\frac{1}{4}$ of the cost, $\frac{4}{4}$ of the cost or the cost = ?

Written.

1. An agent sold a piece of property at an advance of $24.90, which was 20 % of its cost. How much did it cost? *

2. Find the cost of cloth sold at an advance of $.70½ a yard at 15 % profit.

3. A farmer sold 108 A. of land at a loss of $486, which was 20 % of the cost. What was the cost and the selling price per acre?

4. A drover, by selling cattle at $19.50 less than they cost, lost 20 %. How much did they cost?

5. A real estate agent bought two houses for $15000 each and sold one at a gain of 33⅓ % and the other at a loss of 33⅓ %. Find the selling price of each house.

---

6. A house and lot were sold for $830 more than they cost, which was at a gain of 12½ %. What was the cost?

7. John lost 16⅔ % by selling his watch at $10 less than cost. What was the selling price?

8. At 85¢ a square yard, find the cost of a piece of oilcloth 24 ft. long and 15 ft. 9 in. wide.

9. A coal merchant bought 96 T. of coal at $5 a ton, and sold it at a gain of 24 %. How much did he make on the purchase?

10. Simplify : $\dfrac{\frac{1}{2}+\frac{1}{3}}{\frac{3}{4}-\frac{1}{6}}$.

* SUGGESTED METHOD : $\dfrac{\text{Gain or Loss}}{\text{Rate}} = $ Cost. $\;.2\cancel{0})24.9\cancel{0}\overline{}$ or $\begin{array}{r}\$24.90 \\ \times\,5 \\ \hline ? \end{array}$

XXVII

Oral.

Rapidly find the answers:

> 24 is 20 % more than what number?
> 50 is 25 % more than what number?
> 18 is 80 % more than what number?
> 60 is 20 % more than what number?
> 36 is 50 % more than what number?
> 24 is 60 % more than what number?
> 14 is 40 % more than what number?
> 49 is 75 % more than what number?
> 27 is 50 % more than what number?
> 56 is 40 % more than what number?
> $8 \times 7, -6, \div 10, \times 3, +7, \div 2, -2, +3 =$?

1. A farmer sold a horse for $12 less than cost and thereby lost 20 %. How much did the horse cost him?

2. A grocer sold tea at 30 ¢ a pound less than cost and lost $33\frac{1}{3}$ %. What was the cost?

3. A book that cost $4.50 was sold at a gain of $1.50. What was the gain per cent?

4. A dealer sold a cow, which cost him $32, at a gain of 25 %. What was his selling price?

5. How many yards of cloth at $$\frac{3}{4}$ a yard can be bought for $2.25?

Rapidly find the answers:

> 49 is $16\frac{2}{3}$ % more than what number?
> 72 is $14\frac{2}{7}$ % more than what number?
> 39 is $8\frac{1}{3}$ % more than what number?
> 55 is $37\frac{1}{2}$ % more than what number?

27 is $12\frac{1}{2}$ % more than what number?
39 is $62\frac{1}{2}$ % more than what number?
81 is $12\frac{1}{2}$ % more than what number?
33 is $37\frac{1}{2}$ % more than what number?
24 is $14\frac{2}{7}$ % more than what number?
14 is $16\frac{2}{3}$ % more than what number?
Add by 7's to 84.   Subtract by 6's from 100.

6. If I sell an article for $3 and by so doing gain $1, what per cent do I gain?

7. What per cent of $4 is 3 dimes?

8. I sold for 25¢ a knife that cost me 20¢. What per cent was my gain?

9. What is $\frac{3}{4}$ % of 80?

10. If $\frac{2}{5}$ of a yard of ribbon costs 10¢, how many yards can be bought for 80¢?

Written.

1. If a merchant loses 13 % by selling goods for 39¢ a yard less than cost, how should he sell them to gain 8 %?

2. I gain 23 % by selling 24 barrels of apples for $16.56 more than cost. What is the price per barrel?

3. By selling 12 bu. of chestnuts at $23.76 less than cost I lose 44 %. At what price shall I sell them per bushel to gain 16 %?

4. A and B can build a ditch in 30 da.; B can do the work alone in 45 da. In how many days can A do it alone?

5. I bought 3 pieces of cloth containing $125\frac{7}{8}$ yd., $96\frac{3}{4}$ yd., and $48\frac{2}{8}$ yd. How many yards were there in the three pieces?

6. A grocer sold a chest of tea at 25 % profit, by which he made $22¼. How much did the chest cost?

7. A speculator lost $1950 on a lot of flour, which was 20 % of the cost. Find the cost.

8. If $\frac{3}{16}$ of the rent of a store is paid for taxes, and the owner saves $884, what rent does he get for his store?

9. If ¾ of a hogshead is sold for what the whole cost, what is the gain per cent on the part sold?

10. A merchant bought some goods for $1500, which was $500 less than their real value, and sold them at 25 % above their real value. What per cent did he gain?

XXVIII

Oral.

Rapidly find the answers :

> 24 is 25 % less than what number?
> 16 is 20 % less than what number?
> 42 is 75 % less than what number?
> 24 is 40 % less than what number?
> 28 is 12½ % less than what number?
> 30 is 37½ % less than what number?
> 36 is 62½ % less than what number?
> 12 is 87½ % less than what number?
> 32 is 33⅓ % less than what number?
> 17 is 66⅔ % less than what number?

If I sell an article for 20 % more than it cost me, what per cent of the cost represents my selling price? if for 18 % more? 25 % more? 12 % less? 25 % less?

What per cent always represents the cost? If an article is sold for more than the cost, does the seller gain or

lose ?   If it is sold for less than the cost, does he gain or
lose ?   If I sell at a gain of $12\frac{1}{2}$ %, what per cent is my
selling price ?   If I sell for 18¢, at a gain of $12\frac{1}{2}$ %, what
is my cost ?

1. By selling a watch for $60 I gained 20 % on the
cost.   How much did it cost me ? *

2. A farmer sold a mower for $36, losing 25 %.
How much did it cost ?

3. I sold a horse for $145, thereby gaining 25 %.
What was the cost of the horse ?

4. If the selling price is $28 and the gain 40 %, what
is the cost ?

5. If $\frac{2}{3}$ of a yard costs $$\frac{4}{5}$, how much will $\frac{5}{6}$ of a yard
cost ?

———

Rapidly find the answers :

32 is 80 %   less than what number?
16 is 60 %   less than what number?
60 is 40 %   less than what number?
18 is 10 %   less than what number?
30 is $16\frac{2}{3}$ % less than what number?
42 is $12\frac{1}{2}$ % less than what number?
28 is 22$\frac{2}{9}$ % less than what number?
16 is $11\frac{1}{9}$ % less than what number?
50 is 28$\frac{4}{7}$ % less than what number?
12 is 14$\frac{2}{7}$ % less than what number?

<div style="text-align:right">Cost   Gain   S. P.</div>

* SUGGESTED EXPLANATION :   20 % = $\frac{1}{5}$. $\frac{5}{5}$ of C. + $\frac{1}{5}$ of C. = $\frac{6}{5}$ of C.
Since $60 is $\frac{6}{5}$ of the cost, $\frac{1}{5}$ of C. will be $\frac{1}{6}$ of $60 and $\frac{5}{5}$ of C. or the cost
will be $\frac{5}{6}$ of $60.

6. I sold a carriage for $75, which was at a gain of 25 %. How much did it cost?

7. A boot and shoe dealer lost 20 % by selling shoes at $3.60 a pair. Find the cost.

8. By selling vinegar at $4.20 a barrel 14¾ % was lost. What was the cost?

9. An agent sold a village lot for $360 and lost 20 %. For how much should he have sold it to gain 10 %?

10. What per cent of $4 is 3 dimes?

Written.

1. By selling iron rails at $49.50 a ton a profit of 12½ % was made. How much did they cost?*

2. A grocer sold a hogshead of molasses for $31.50, which was at a loss of 30 %. Find the cost.†

3. What is the cost of silk sold for $4.13 a yard at a gain of 18 %?

4. A merchant lost 15 % by selling damaged delaine at 17 ¢ a yard. How much did it cost him a yard?

5. A man bought a house for $1000, his taxes were $300, and his other expenses $125. What per cent did he gain by selling it for $1600?

---

6. Find the cost of carpet sold at $1.96 a yard at a gain of 16⅔ %.

* **SUGGESTED METHOD:** $\dfrac{\text{Selling Price}}{100\% + \text{G.}\%} = \text{Cost}$ Selling $\left\{\begin{array}{l}\text{Cost } 100\% \text{ or } \frac{8}{8} \\ + \text{ G. } 12\frac{1}{2}\% \text{ or } \frac{1}{8} \\ \hline = ?\% \text{ or } \frac{9}{8}\end{array}\right.$ Price $49.50

† $\dfrac{\text{Selling Price}}{100\% - \text{L.}\%} = \text{Cost}$ Selling $\left\{\begin{array}{l}\text{Cost } 100\% \text{ or } \frac{10}{10} \\ - \text{ L. } 30\% \text{ or } \frac{3}{10} \\ \hline = ?\% \text{ or } \frac{7}{10}\end{array}\right.$ Price $31.50

7. Find the cost of coal sold for $6.50 a ton at a gain of 30 %.

8. Mr. Watson sold some goods for $42, which was at $12\frac{1}{2}$ % loss. What was the cost?

9. A dealer sold a lot for $2755 and lost 5 %. For how much should he have sold it to gain $12\frac{1}{2}$ % ?

10. How much silver is there in 26 T. of ore that yields $2\frac{1}{2}$ % of metal to the ton?

XXIX

Oral.

Rapidly find the base :

Percentage	Rate	Percentage	Rate	Percentage	Rate
$20	80 %	$10	$\frac{1}{5}$ %	$14	$14\frac{2}{7}$ %
$45	90 %	$16	$\frac{1}{2}$ %	$15	$37\frac{1}{2}$ %
$50	10 %	$10	$\frac{1}{8}$ %	$30	$16\frac{2}{3}$ %
$30	50 %	$12	$\frac{2}{3}$ %	$40	$14\frac{2}{7}$ %

If the length and width of a field are known, tell how to find the square contents or area. A field 40 rd. long and 40 rd. wide contains how many square rods? How many acres are there in it? What is the shape of the field? If the area and the width of a field are known, tell how to find the length. If the area and the length are given, tell how to find the width. A field contains 1200 sq. rd. and is 40 rd. long. How wide is it? If a field contains 2 A. and is 8 rd. wide, how long is it?

1. A blackboard in the classroom is 12 ft. long and 3 ft. wide. How much will it cost to slate it at $\frac{3}{4}$ a square yard?

2. What is $\frac{1}{2}$ % of $600?

3. Six dollars is $\frac{1}{2}\%$ of how many dollars?

4. I sold a handbag for $4 and gained $1. What was my gain per cent?

5. How much will $\frac{1}{2}$ lb. of butter cost if $\frac{3}{4}$ of a pound cost 24 ¢?

Rapidly find the base:

Percentage	Rate	Percentage	Rate	Percentage	Rate
$200	25 %	$200	$\frac{1}{2}$ %	$150	$33\frac{1}{3}$ %
$160	80 %	$300	$\frac{1}{3}$ %	$250	$55\frac{5}{9}$ %
$240	60 %	$100	$\frac{1}{5}$ %	$300	$33\frac{1}{3}$ %
$200	20 %	$200	$\frac{1}{4}$ %	$400	$66\frac{2}{3}$ %

6. What part of an acre does a field contain that is 40 rd. long and 2 rd. wide?

7. What is the area of a rectangle 20 ft. by 16 ft.?

8. How much will a farmer gain on a horse which cost him $120 if he gains $33\frac{1}{3}$ % when he sells the horse?

9. If 4 lb. of maple sugar cost 60 ¢, how much will 4 oz. cost?

10. Mary studies at home each day 10 % of 24 hr. How many hours and minutes does she study each day?

Written.

1. Add: $246\frac{5}{8}$
$32\frac{5}{6}$
$407\frac{3}{4}$
$282\frac{1}{2}$
$48\frac{3}{8}$
$49\frac{1}{4}$
$287\frac{1}{6}$

2. If a factory sells 3250 ready-made suits for $81250, what is the price of each suit?

3. If the population of a certain town was 147178 and 20 yr. later it was 2502026, what was the increase? What per cent was it?

4. A grocer by selling molasses at 93¢ a gallon made a profit of 24 %. How much did he pay for it?

5. I sold a case of linens for $150, making a profit of 25 %. What was the cost?

---

6. In 1911 the following values were received for our exported articles: Iron and steel manufactures, $230725352, copper manufactures, $103813110, wool manufactures, $2293473, leather manufactures, $53673056, and cotton manufactures, $40851918. Find the total amount of money received by the exporting of these articles.

7. If an investment gives a profit of 13 % by selling for $7345, what per cent would it realize by selling for $7500?

8. By selling 568 bbl. of beef at $15½ a barrel, a butcher lost 20 %. How much did it cost him?

9. If a tank, the capacity of which is 420 gal., is ⅝ full, what part of it would be filled if 87½ gal. were added?

10. Simplify: $\dfrac{\frac{4}{5}+1\frac{3}{4}}{2\frac{1}{5}} \div \dfrac{2\frac{1}{6}+1\frac{1}{4}}{4\frac{1}{2}-3\frac{1}{8}}$.

XXX

Oral.

Rapidly find the base:

Amount	Diff.	Rate	Amount	Diff.	Rate
$60	$60	25 %	$63	$63	12½ %
$35	$35	16⅔ %	$24	$24	20 %
$72	$72	14²⁄₇ %	$18	$18	80 %
$48	$48	60 %	$80	$80	11⅑ %
$42	$42	40 %	$14	$14	75 %

1. If I sell $\frac{1}{2}$ of an article for what $\frac{3}{4}$ of it cost, what per cent do I gain on the part sold?

2. A man sold wheat at 30¢ a bushel more than it cost and gained 20 %. How much did it cost?

3. A grocer sold tea for 90¢ a pound, and gained 25 %. What was the cost?

4. At what price must an article that cost $5 be sold to gain 200 %?

5. I gained 12¢ on an article that was sold for 36¢. What was the gain per cent?

Rapidly find the base:

Amount	Diff.	Rate	Amount	Diff.	Rate
$40	$40	29 %	$44	$50	$37\frac{1}{2}$ %
$28	$28	75 %	$60	$42	$33\frac{1}{3}$ %
$24	$24	60 %	$30	$24	$66\frac{2}{3}$ %
$21	$21	40 %	$32	$40	$14\frac{2}{7}$ %
$45	$45	50 %	$81	$35	$12\frac{1}{2}$ %

6. By selling cloth at 25¢ a yard a merchant gained 25 %. How much did the cloth cost?

7. James sold a knife for 30¢, thereby gaining 5¢. What per cent did he gain?

8. Two thirds is $\frac{4}{5}$ % of how many times $\frac{5}{6}$?

9. A farmer bought sheep at $5 a head. He sold them at a gain of $16\frac{2}{3}$ %, and made a profit of $30. How many sheep did he buy?

10. Find the rate of gain or loss when $\frac{3}{4}$ of a barrel of sugar is sold for $\frac{4}{5}$ of its cost.

Written.

1. I bought a house for $2500, but as property depreciated in value, I had to sell it at a loss of 30 %. What was the selling price?

2. If I pay 22½ ¢ a pound for lard and sell it at 2½ ¢ advance, what is my gain per cent?

3. A man sold a house at a profit of 33⅓ % and thereby gained $7500. Find the cost and the selling price.

4. A dealer sold a carriage for $210 and gained 12 %. How much did it cost?

5. A merchant sold goods for $7.52 and lost 6 % on the cost. For how much should they have been sold to gain 25 %?

6. A coal dealer bought 500 T. of coal at $4.20 a ton, and sold it at 27 % advance. What was the selling price?

7. If tea costs 75 ¢ a pound and I sell it for 95 ¢ a pound, what is the gain per cent?

8. A drygoods merchant lost 65 ¢ a yard on cloth, which was 13 % of the cost. Find the cost and the selling price.

9. An agent sold a house for $2484 and gained 8 %. How much did the house cost?

10. Goods were sold for $2500 at a gain of 25 %. What was the cost of the goods? the gain? What would the selling price have been if they had been sold at a gain of 40 %?

XXXI

Oral.

Rapidly find the gain or loss:

Cost	Rate of Gain	Rate of Loss	Cost	Rate of Gain	Rate of Loss
$40	20 %	$12\frac{1}{2}$ %	$24	$12\frac{1}{2}$ %	25 %
$60	25 %	$33\frac{1}{3}$ %	$36	$37\frac{1}{2}$ %	30 %
$48	75 %	$16\frac{2}{3}$ %	$72	$16\frac{2}{3}$ %	25 %
$27	30 %	$11\frac{1}{9}$ %	$96	$33\frac{1}{3}$ %	50 %
$80	80 %	$37\frac{1}{2}$ %	$64	$12\frac{1}{2}$ %	75 %

If I sold a carriage for $120 and gained 25 %, how much did I pay for it? If I sold another carriage for $120 and lost 25 %, how much did I pay for the second carriage? How much did they both cost? For how much did I sell both? What was my gain or loss on both? Tell how to find the cost when the selling price and the gain per cent are given. Tell how to find the cost when the selling price and the loss per cent are given.

1. I sold two lots for $120 each. On one I gained 20 % and on the other I lost 20 %. How much did I gain or lose on both?

2. A horse was sold for $240 and $40 was gained. What was the gain per cent?

3. A horse was sold for $240 and $40 was lost. What was the loss per cent?

4. A man is taxed $\frac{1}{8}$ % on $6400. How much is he taxed?

5. I lost $10 on a harness which I sold for $40. What was the per cent of loss?

Rapidly find the gain or loss:

Cost	Rate of Gain	Rate of Loss	Cost	Rate of Gain	Rate of Loss
$80	12½ %	25 %	$150	30 %	25 %
$32	37½ %	75 %	$500	60 %	50 %
$48	33⅓ %	6¼ %	$200	25 %	20 %
$24	83⅓ %	8⅓ %	$600	40 %	12 %
$96	62½ %	25 %	$250	60 %	30 %

6. Mary had 42 chickens and Jane 33⅓ % more. How many had they together?

7. If Jane sold 12½ % of her chickens, how many had she left?

8. A clerk had his monthly wages increased $5 or 10 %. How much did he receive a month before the increase? how much a year?

9. A farmer sold a horse for $125, and by so doing gained 25 %. Find the cost.

10. The same farmer sold a cow for $50, which was 83⅓ % of the cost. How much did he lose? What was his entire gain or loss in both transactions?

Written.

1. A real estate agent sold 2 houses for $3000 each. On one he gained 20 % and on the other he lost 20 %. How much did he gain or lose on both?

2. A jockey sold 2 horses for $420 each. On one he gained 16⅔ % and on the other he lost 16⅔ %. What was the entire gain or loss on both?

3. Two houses were sold for $2500 each. On one there was a loss of 8 % and on the other a gain of 8 %. Find the entire gain or loss.

4. A owed B a sum of money. At one time he paid him 40 % of it; afterward, he paid him 25 % of what he still owed, and finally he paid him 20 % of what he then owed. What per cent does he still owe?

5. How many steps of 30 in. each must a person take in walking 21 mi.?

6. A man sold 2 lots for $4800 each. On one he gained 20 % and on the other he lost 20 %. What was the entire gain or loss?

7. A dealer sold 2 horses for $350 each. On one he gained 15 % and on the other he lost 15 %. How much did he gain or lose on both?

8. A certain number is increased by $\frac{1}{3}$ and $\frac{2}{5}$ of itself; then 420 is added and the sum thus obtained is divided by 4. If the result is 237, what is the original number?

9. A man bought a house and lot for $8500. He sold it for 20 % more than he gave for it. How much did he receive for it?

10. A farmer who raised 875 bu. of corn sold 9 % of it. How many bushels did he sell?

XXXII

Oral.

Rapidly find the selling price:

Cost	Rate of Gain	Rate of Loss		Cost	Rate of Gain	Rate of Loss
$30	$16\frac{2}{3}$ %	$16\frac{2}{3}$ %		$48	$16\frac{2}{3}$ %	$16\frac{2}{3}$ %
$40	$12\frac{1}{2}$ %	$12\frac{1}{2}$ %		$56	$12\frac{1}{2}$ %	$12\frac{1}{2}$ %
$24	$33\frac{1}{3}$ %	$33\frac{1}{3}$ %		$32	$37\frac{1}{2}$ %	$37\frac{1}{2}$ %
$42	$14\frac{2}{7}$ %	$14\frac{2}{7}$ %		$60	$66\frac{2}{3}$ %	$66\frac{2}{3}$ %
$36	$11\frac{1}{9}$ %	$11\frac{1}{9}$ %		$80	$62\frac{1}{2}$ %	$62\frac{1}{2}$ %

Tell how to add common fractions. Tell how to add mixed numbers. Tell how to add decimal fractions. Tell how to add denominate numbers.

What is a denominate number? a common fraction? a decimal fraction?

1. Susan paid $\$\frac{3}{10}$ for some ribbon and $\$\frac{4}{5}$ for a pair of gloves. How much did she pay for both?

2. What is the sum of .45 and .3?

3. A grocer sold 2 bu. 3 pk. of apples one day and 1 bu. 2 pk. another day. How many bushels and pecks did he sell in the two days?

4. What per cent of 2 gal. is 1 qt. 1 pt.?

5. Reduce $\frac{2}{3}$ of a day to hours and minutes.

———

Rapidly find the selling price:

Cost	Rate of Gain	Rate of Loss	Cost	Rate of Gain	Rate of Loss
$\$60$	30%	$16\frac{2}{3}\%$	$\$56$	$87\frac{1}{2}\%$	$12\frac{1}{2}\%$
$\$48$	50%	$33\frac{1}{3}\%$	$\$64$	$37\frac{1}{2}\%$	$37\frac{1}{2}\%$
$\$40$	10%	$62\frac{1}{2}\%$	$\$60$	$66\frac{2}{3}\%$	$66\frac{2}{3}\%$
$\$80$	40%	$37\frac{1}{2}\%$	$\$48$	$33\frac{1}{3}\%$	$33\frac{1}{3}\%$
$\$72$	25%	$87\frac{1}{2}\%$	$\$42$	$16\frac{2}{3}\%$	$16\frac{2}{3}\%$

6. One automobile travels at the rate of 40 mi. an hour and another 75 % as fast. What is the rate of the second?

7. An aëroplane rose to the height of 960 ft., which was 20 % higher than it rose the day before. How high was it the day before?

8. If a man owes $360 and pays $270, what per cent of his debts does he pay?

GR. AR. 6TH YR. 2D HALF — 6

9. What per cent is gained when a horse is sold for $200, at a loss of $40?

10. How many days are there from March 15 to Decoration Day?

Written.

1. Add: $4867.89

9768.83

8432.78

4791.11

326.15

2414.94

1963.81

3456.78

999.99

1432.63

2345.76

2. What is **reduction ascending**? **reduction descending**? Reduce 17 yd. 2 ft. 11 in. to inches.

3. Reduce 5722 inches to yards, feet, and inches.

4. At 35¢ a load, how much will it cost to dig a cellar 18 ft. long, 15 ft. wide, and 6 ft. deep?

5. If goods costing $625 are sold for 5 % less, what is the selling price?

6. Add five tenths, sixty-two hundredths, eighty-one thousandths, two hundred thirty-seven hundred-thousandths, seventy-nine thousand three hundred twenty-eight hundred-thousandths, forty-seven thousand twenty-four millionths, six hundred seventy-nine hundredths, ten thousand five hundred four millionths, sixty-two ten-millionths, twelve thousand one hundred eleven ten-millionths.

7. From a pile of wood containing 26 cd. there were sold 17 cd. 100 cu. ft. How much wood was left in the pile?

8. How many years, months, and days have elapsed since the surrender of Cornwallis at Yorktown?

9. Reduce 12 cu. yd. 8 cu. ft. 5 cu. in. to cubic inches. Prove.

10. Two lots were sold for $1200 each. On one there was a gain of 15%, and on the other a loss of 15%. What was the entire gain or loss?

XXXIII

Oral.

Rapidly find the rate of gain or loss:

Cost	Selling Price	Gain	Loss		Cost	Selling Price	Gain	Loss
$20	$24	—	—		—	$48	—	$2
—	$30	$5	—		$30	$40	—	—
—	$36	—	$4		$56	$49	—	—
$15	—	—	$3		$30	—	$5	—
—	$42	$6	—		—	$32	$8	—

1. A man who had 30 horses sold 16⅔% of them to each of 4 dealers. How many had he left?

2. If a grocer pays $2 for 6 lb. of tea and sells 4 lb. for $3, what is his per cent of profit?

3. By selling a village lot for $160 I lost 20%. At what price should I have sold it to make 25%?

4. James Hicks sold a cow for $72, and gained 12½%. What per cent would he have gained or lost had he sold it for $56?

5. If ⅔ of a bushel costs $¼, how much will ⅝ of a bushel cost?

Rapidly find the rate of gain or loss:

Cost	Selling Price	Gain	Loss	Cost	Selling Price	Gain	Loss
$200	$250	—	—	$320	$340	—	—
$250	$200	—	—	$420	—	$60	—
—	$100	$25	—	—	$420	$20	—
—	$100	—	$25	—	$420	—	$20
$300	—	$50	—	$450	—	—	$30

6. A flour merchant by selling flour at $6.25 a barrel made a profit of 25%. How much did the flour cost?

7. A boy sold popcorn for $1.20 a peck and made a profit of 50%. How much did the corn cost a bushel?

8. A boy who had 50¢ gave 30% of his money to each of his three sisters. How much did he keep?

9. I sold a book for 70¢ thereby losing 14¢. What was my loss per cent?

10. A cart was sold for $40 at a loss of 20%. The buyer then sold it to gain 25%. For how much did he sell it?

Written.

1. Mr. Brown sold his two horses for $420 each. On one he gained 20%, and on the other he lost 20%. What was his entire gain or loss?

2. Three gallons 3 qt. is what per cent of $21\frac{1}{2}$ gal.?

3. A merchant sold carpet at 92¢ a yard and cleared 15%. At what price should he have sold it per yard to clear $18\frac{3}{4}$%?

4. An agent sold land at $96.05 an acre, which was at a gain of 13%. At that rate what was the gain on 65 A?

5. How many vessels each holding ⅜ gal. can be filled from ¼ of a barrel?

6. $7.29 is what per cent of $216?

7. Find the cost of a horse sold at $240 at a loss of 15%.

8. A grocer buys apples at the rate of $2.12½ a barrel and sells them at the rate of $2.87½. What is his gain per cent?

9. How much copper is there in 18 T. of ore, if it yields 45% to the ton?

10. (*a*) The base is $7.50, the rate is ½%. Find the percentage.

(*b*) The base is $1200, the rate ⅔%. Find the amount.

XXXIV
Oral.

Rapidly find the cost :

Gain	Rate	Loss	Rate	Gain	Rate
$25	20%	$100	40%	$28	14²⁄₇%
$60	25%	$120	60%	$56	86½%
$15	30%	$200	25%	$36	12½%
$20	25%	$120	75%	$48	66⅔%

How many pints are there in a quart? in a gallon? Compare a pint with a quart; a quart with a gallon.

How many inches are there in a foot? in a yard? How many feet are there in a yard? in a mile? How many yards are there in a mile? Compare a yard with a foot. Compare a yard with an inch.

What part of a yard is an inch? a foot? What part of a mile is a yard? a foot?

How many square inches are there in a square foot? How many square feet are there in a square yard? A square inch is what part of a square foot? A square foot is what part of a square yard?

1. Reduce 5 yd. 2 ft. to feet. How many inches are there? What part of 5 yd. is 2 ft.?

2. How many square inches are there in 2 sq. ft.? How many square feet are there in 2 sq. yd.?

3. A merchant sold a hat listed at $15 at a discount of 10%. What was the discount? the selling price?

4. A man sold a· harness for $15 and lost $16\frac{2}{3}\%$. How much would the selling price have been had he sold it to gain 20%?

5. By selling hay at $9 a ton I lose 10%. At what price per ton must I sell it to gain 20%?

Rapidly find the cost:

Gain	Rate	Loss	Rate	Loss	Rate
$30	$3\frac{1}{8}\%$	$50	$83\frac{1}{3}\%$	$18	40%
$60	$6\frac{2}{3}\%$	$42	$14\frac{2}{7}\%$	$34	25%
$80	$6\frac{1}{4}\%$	$18	$11\frac{1}{9}\%$	$36	60%
$50	$8\frac{1}{3}\%$	$14	$66\frac{2}{3}\%$	$27	75%

6. I sold a dining room set of furniture for $175 and thereby gained 25%. How much did it cost me?

7. How much will $7\frac{1}{2}$ lb. of beefsteak cost at 24¢ a pound?

8. A boy sold his sled for $3, which was 60% of its original cost. What was the cost?

9. A farmer sold 224 bu. of rye, which was 40% of his entire crop. How many bushels had he remaining?

10. Coal bought at $4.50 a ton was sold at a gain of 16⅔ %. Find the selling price.

Written.

1. If I make 20 % profit on goods, what sum must I lay out to clear $3500?

2. If by selling land at $125 an acre I lose $25, at what price must I sell it to gain 40 %?

3. A man owning 60 % of the shares of a ship sells 7½ % of his shares for $2700. How much is the ship worth?

4. A can do a piece of work in ¾ of a day, B can do the same work in ⅘ of a day, and C can do it in 1⅛ da. In what time can all do it, working at these rates together?*

5. (*a*) Reduce 3 sq. yd. 20 sq. ft. 3 sq. in. to square inches. (*b*) Reduce 2736 sq. in. to square yards and square feet.

----

6. A clerk's salary is $2000 a year. He spends 10 % of it in board, 15 % in clothing, 6 % for books, and 4 % for other expenses. How much does he save?

7. C and D have 1000 sheep apiece. If C adds 15 % to his flock, and D sells 12 % of his, how many sheep will each have?

8. How much is 12½ % of 6 lb. 8 oz. 12 pwt. ?

9. I bought the following articles in a department store: 8 yd. silk at $1.25, 5 yd. lining at 8¢, 1 lamp for $10, 2 pairs of gloves at $1.75, 4 chairs at $1.50. Find the amount of the bill.

---

* SUGGESTION: If A can do a piece of work in ¾ of a day, how much can he do in 1 day? etc.

10. (*a*) Reduce 24 sq. yd. 8 sq. ft. 36 sq. in. to square inches.   (*b*) Reduce 4872 sq. in. to higher denomination.

XXXV

Oral.

Rapidly find the cost:

Selling Price	Rate of Gain	Selling Price	Rate of Gain	Selling Price	Rate of Gain
$40	60 %	$45	$12\frac{1}{2}$ %	$22	$37\frac{1}{2}$ %
$28	40 %	$42	$16\frac{2}{3}$ %	$36	$12\frac{1}{2}$ %
$27	50 %	$56	$14\frac{2}{7}$ %	$20	$11\frac{1}{9}$ %
$44	30 %	$33	$37\frac{1}{2}$ %	$72	$33\frac{1}{3}$ %

1. A boy sold his penknife for 40¢ and lost 8¢. What per cent did he lose?

2. Jane sold her doll to a little friend for $1.20 and gained 30¢. What was her gain per cent?

3. An agent sold 2 lots for $150 each. On one he gained 25 % and on the other he lost 25 %. What was his entire gain or loss?

4. A merchant sold a yard of silk for $2 and lost $33\frac{1}{3}$ %. For how much would he have to sell it to gain $16\frac{2}{3}$ %?

5. What is $\frac{5}{8}$ of $8?

Rapidly find the cost:

Selling Price	Rate of Gain	Selling Price	Rate of Gain	Selling Price	Rate of Gain
$25	$66\frac{2}{3}$ %	$35	40 %	$39	$62\frac{1}{2}$ %
$80	$33\frac{1}{3}$ %	$54	80 %	$22	$37\frac{1}{2}$ %
$56	$14\frac{2}{7}$ %	$30	20 %	$63	$12\frac{1}{2}$ %
$32	$16\frac{2}{3}$ %	$26	$8\frac{1}{3}$ %	$50	$11\frac{1}{9}$ %

6. By selling a top for 25¢ a gain of 25 % was made. For how much would it be sold if 10 % were lost?

7. If I make 20¢ on a bottle of wine that I sell for 80¢, what per cent do I gain?

8. I gained 40¢ on a tie that I sold for $1. What per cent did I gain?

9. What per cent of $1 is ¼ of a dime?

10. If ¾ of a pound of butter costs $¼, how much will 6 lb. cost?

Written.

1. A speculator sold two houses at $2484 each. On one he gained 8 % and on the other he lost 8 %. How much did he gain or lose on both?

2. A merchant's income is $5760 a year, at a gain of 18¾ % on his capital. How much would have been his income at a gain of 25 % on his capital?

3. A carload of grain worth $620 is found to be damaged and is sold for $500. What is the loss per cent?

4. Goods were sold for $7.90 at a loss of 6 % on the cost. For how much should they have been sold to gain 25 %?

5. A grocer sold 62 bbl. of apples for $138.88 at a gain of 33⅓ %. How much did they cost him a barrel?

6. An agent sold 2 farms for $4838 each, losing 18% on one and gaining 18 % on the other. What was his entire gain or loss by the sale?

7. If I buy 2 horses for $150 each, and sell one at a gain of 20 % and the other at a loss of 20 %, how much do I gain or lose on the transaction?

8. A merchant gained $23.50 on cloth which he sold for $116.50.   What per cent did he gain?

9. A farmer sold a number of cows for $315, which was at a loss of $12\frac{1}{2}\%$.   At what price should they have been sold to gain $16\frac{2}{3}\%$?

10. I sold a quantity of goods for $200 and thereby gained 15%.   Had I sold them for $20 more than I did, what per cent should I have gained?

XXXVI

Oral.

Rapidly find the cost:

Selling Price	Rate of Loss	Selling Price	Rate of Loss	Selling Price	Rate of Loss
$30	$37\frac{1}{2}\%$	$30	$62\frac{1}{2}\%$	$80	75%
$39	$62\frac{1}{2}\%$	$30	$87\frac{1}{2}\%$	$36	40%
$56	$12\frac{1}{2}\%$	$24	$33\frac{1}{3}\%$	$32	60%
$80	$37\frac{1}{2}\%$	$40	$66\frac{2}{3}\%$	$15	70%

Tell how to find the selling price when the cost is given. If I pay $20 for a vase, for how much must I sell it to gain 25%?   What per cent of the cost equals my selling price?

What price shall I put on this vase so that I may deduct $16\frac{2}{3}\%$ from the marked price and sell it for $25?   The marked price being 100% of itself and a deduction of $16\frac{2}{3}\%$ or $\frac{1}{6}$ of the marked price being made, the selling price will be what per cent of the marked price? $25 = 83\frac{1}{3}\%$, or $\frac{5}{6}$, of what number?

I bought a chair for $1.50 and wish to sell it at a gain of 20%.   For how much must I sell it?   I want to mark it so that I may deduct $33\frac{1}{3}\%$ from my marked price and

still sell it at $1.80. How shall I mark it? $1.80 $= 100\% - 33\frac{1}{3}\%$ of the marked price.

1. How shall I mark a hat that cost me $3 so that I may deduct 20 % from the marked price and still gain $33\frac{1}{3}\%$ on the cost? *

2. How shall I mark goods that cost me $2 a yard in order to deduct 25 % from the marked price and still gain 50 % on the cost?

3. What must be the asking price of goods bought for $3.50 a yard in order that $11\frac{1}{9}\%$ may be deducted from the marked price and still a gain of $14\frac{2}{7}\%$ be made?

4. A merchant sold muslin at 34¢ a yard, at a deduction of 15 % from his marked price. At what price had he marked it?

5. If a ton of coal is worth $3.50, how much will $4\frac{1}{4}$ T. be worth?

———

Rapidly find the cost:

Selling Price	Rate of Loss	Selling Price	Rate of Loss	Selling Price	Rate of Loss
$51	25 %	$28	$22\frac{2}{9}\%$	$50	80 %
$30	$6\frac{1}{4}\%$	$16	$11\frac{1}{9}\%$	$24	60 %
$33	$8\frac{1}{3}\%$	$15	$28\frac{4}{7}\%$	$30	75 %
$45	10 %	$30	$14\frac{2}{7}\%$	$40	60 %

* SUGGESTED EXPLANATION:

$\qquad$ Cost $\qquad$ Gain $\qquad$ S. P.

$33\frac{1}{3}\% = \frac{1}{3}$ $\quad$ $\frac{1}{3}$ of C. $+ \frac{1}{3}$ of C. $= \frac{4}{3}$ of C.; $\frac{4}{3}$ of $3 = 4, Selling Price.

$\qquad$ M. P. $\qquad$ Loss $\qquad$ S. P.

$20\% = \frac{1}{5}$ $\quad$ $\frac{5}{5}$ of M. P. $- \frac{1}{5}$ of M. P. $= \frac{4}{5}$ of M. P. Since $4 is $\frac{4}{5}$ of M. P., $\frac{1}{5}$ of M. P. will be $\frac{1}{4}$ of $4 and $\frac{5}{5}$ of M. P. will be $\frac{5}{4}$ of $4. $\frac{5}{4}$ of $4 = ?

6. How must goods be marked that cost $1.60 a yard in order to gain $12\frac{1}{2}$ % on the cost, and still deduct 10 % from the marked price?

7. I bought a watch for $72 which was $266\frac{2}{3}$ % of the cost of the chain. How much did the chain cost?

8. Eight inches is what per cent of a yard?

9. When silk was sold for $4 a yard, there was a gain of $33\frac{1}{3}$ %. What was the cost?

10. A pole stands so that $\frac{1}{4}$ of its length is in mud, $\frac{1}{3}$ of it in water, and the remainder, which is 50 ft., is in the air. How long is the pole?

Written.

How must goods be marked that cost $60 so that 4 % may be deducted from the marked price and a gain made of 20 % ? *

1. If cloaks cost $24 apiece, at what price must they be marked, so that after deducting 10 %, the merchant may realize 50 % profit?

2. A dealer bought shoes at $2.55 a pair. At what price must they be marked so that after 15 % has been deducted from the marked price they may be sold at 20 % profit?

---

* SUGGESTED METHOD :

$$\$\frac{\overset{12}{\cancel{60}}}{1} \times \frac{6}{\cancel{5}} = \$72, \text{ S. P.}$$ Or, in one statement :

$$\$\frac{\overset{3}{\cancel{72}}}{1} \times \frac{25}{\cancel{24}} = \$75, \text{ M. P.}$$ $$\$\frac{\overset{12}{\cancel{60}}}{1} \times \frac{\overset{3}{\cancel{6}}}{\cancel{5}} \times \frac{25}{\underset{2}{\cancel{24}}} = \$75, \text{ M. P.}$$

3. How must I mark muslin that cost 9¢ a yard, so as to take off 10 % from the marked price and still make 50 % ?

4. How must goods be marked that cost $1.12 so as to take off $12\frac{1}{2}$ % and still clear 25% ?

5. Mr. J. Williams bought of Smith Bros., Jan. 1, 1913, the following articles : 1 soup tureen, $2.50; 1 doz. butter plates, 50¢; 2 glass pitchers @ 62¢; 5 glass dishes @ 50¢. Make out and receipt the bill.

------

6. How must goods be marked that cost $3\frac{1}{2}$ a yard so that $12\frac{1}{2}$ % may be deducted from the marked price and still a profit may be made of 15 % ?

7. What must be the marked price of hats that cost $3.29 each, that $12\frac{1}{2}$ % may be deducted from the marked price and still a gain may be made of $12\frac{1}{2}$ % ?

8. A dealer bought coal at $3.75 a ton. How much must he ask a ton that he may be able to deduct 15 % from his asking price and still make a profit of $12\frac{1}{2}$ % on the cost?

9. A merchant sells muslin for $2\frac{1}{2}$¢ above cost and makes a profit of 20 %. Find the cost.

10. A can do a piece of work in 9 da. ; A and B together can do the same work in 6 da. : A, B, and C working together can do it in 4 da. In how many days can B and C working together at these rates do the work? C alone ? *

* SUGGESTION : The work done in 1 day by A, B, and C minus the work done in 1 day by A equals the work done in 1 day by B and C. The work done in 1 day by A, B, and C minus the work done in 1 day by A and B equals the work done in 1 day by C.

XXXVII

Oral.

Rapidly find the term marked "?":

Cost	Rate of Gain	Rate of Loss	Gain	Loss	Selling Price
$20	20 %	25 %	?	?	—
$60	16⅔ %	—	—.	—	?
$40	?	?	$5	$4	—
—	?	?	$2	$4	$32
?	12½ %	—	$12	—	?
?	—	25 %	—	—	$42
?	11⅑ %	66⅔ %	$20	$14	—
—	?	?	$15	$12	$60
$35	14²⁄₇ %	20 %	?	?	—
$48	—	12½ %	—	—	?

1. How shall I mark goods that cost me $20 so that I may gain 20 % on the cost and yet deduct 16⅔ % from the marked price?

2. A man sold a carriage for $240 and gained 20 %. How much did he gain?

3. What is $\frac{5}{12}$ % of $4800?

4. An agent sold a house for $3000 and lost 20 % of his money. How much did it cost him?

5. The same agent sold another house for $3000 and gained 20 %. How much did the second house cost him? How much did both houses cost? What was the selling price of both? Was there a gain or a loss and how much, on the two houses together?

Rapidly find the term marked " ? " :

Cost	Rate of Gain	Rate of Loss	Gain	Loss	Selling Price
$100	25 %	5 %	?	?	—
$100	—	25 %	—	—	?
$150	33⅓ %	—	—	—	?
$200	?	—	?	—	$240
$200	—	?	—	?	$150
?	20 %	12½ %	$100	$50	?
?	16⅔ %	33⅓ %	$150	$28	?
?	?	—	$50	—	$250
?	—	?	—	$50	$300
?	25 %	16⅔ %	?	?	$450

6. How much must I ask for a cloak that cost $30 so that I may allow 20 % discount and still gain 20 % ?

7. If 2 horses are sold for $50 each, and 16⅔ % is lost on one and 25 % is gained on the other, what is the entire gain or loss?

8. Three desks are bought for $10 each and sold for $45. What is the rate of gain?

9. How much will 36 yd. of cloth cost at $2.75 per yard?

10. If ⅔ of a yard of cloth costs $⅗, how much will 1¼ yd. cost? (Analyze the example.)

Written.

1. How much must a jeweler ask for a ring that cost $40 so that he may deduct 20 % and still gain 10 % ?

2. What must be the price of goods that cost $18 in order that a profit of 33⅓ % may be made if they are sold for 40 % less than the price?

3. What must be the asking price of books that cost $1.60 in order that after 20 % is deducted a profit of 25 % may be made?

4. An agent sold some property for $7011, which was a loss of 18 %. What per cent would he have gained by selling it for $9975?

5. Divide 60.077018 by 20.009 and multiply the result by $562\frac{1}{2}$.

6. If cloth cost a tailor $4.50 a yard, how much must he ask for it so that he may deduct 10 % from his asking price and still make 15 %?

7. By selling goods for $85 a merchant loses 15 %. At what price should he have sold them to gain 20 %?

8. A man sold 2 houses for $5000 each. On one he gained 25 % and on the other he lost 20 %. What was his entire gain or loss?

9. At $6 a cord, what is the value of a pile of wood 12 ft. long, 4 ft. wide, and 9 ft. high?

10. What is the value of $\dfrac{.035 \times .0056}{.00007}$?

XXXVIII

Oral.

Rapidly answer:

$137 + 87$	$297 - 198$	48×20	$234 \div 10$
$149 + 64$	$292 - 175$	32×30	$428 \div 20$
$126 + 79$	$254 - 186$	24×40	$336 \div 30$
$157 + 57$	$237 - 159$	14×50	$424 \div 40$
$139 + 77$	$237 - 199$	12×60	$175 \div 50$
$146 + 95$	$222 - 167$	13×70	$360 \div 60$

An inch is what part of a foot? of a yard? A yard is how many times a foot? · how many times an inch? In 2 ft. 8 in. how many inches are there? A rope is 96 in. long. How many feet long is it? how many yards long?

1. In 2 yd. 2 ft. 8 in. how many inches are there?

2. How many feet are there in 5 yd. 2 ft.?

3. James spent $\frac{1}{2}$ of his money for a ball and $\frac{1}{5}$ of it for a bat. What part of his money did he spend? If he had 18¢ left, how much had he at first?

4. How many barrels holding $2\frac{1}{2}$ bu. each must a farmer buy to barrel 60 bu. of apples?

5. If a bushel of walnuts costs $6.40, how much will 6 qt. cost?

Rapidly answer:

177 + 55	298 — 199	54 × 10	146 ÷ 10
137 + 86	292 — 175	42 × 20	320 ÷ 20
163 + 68	254 — 186	34 × 30	450 ÷ 30
156 + 85	237 — 159	26 × 40	164 ÷ 40
157 + 86	299 — 137	18 × 50	255 ÷ 50
175 + 78	267 — 122	15 × 60	366 ÷ 60

6. In a certain school 20 % of the 320 arithmetics for the sixth grade are worn out. How many new ones must be bought to replace them?

7. Mr. Waters sold 48 A. from his farm of 144 A. What per cent of his farm did he keep?

8. A carpet was sold for $9 at a loss of $3. What per cent was lost?

9. A merchant sold calico for 10 % more this year than last year ; this year he sold it for 11¢ a yard. What was the price last year ?

10. How shall I mark hats that cost $5 so that I can deduct .25 % from the marked price and still make a profit of 20 % ?

Written.

1. An agent sold two lots for $782 each.   On one he gained 15 %, on the other he lost 15 %.   How much did he lose in the operation ?

2. I sold a farm at a profit of $17\frac{1}{2}$ %, thereby gaining $385.   How much did I receive for it ?

3. Goods that cost $125 were sold for $115.   What per cent was lost ?

4. James G. Hall & Co., Springfield, Ill., bought of T. W. Lamont & Co., St. Louis, Mo., 3 doz. gold rings at $86 per dozen; 4 gold rings, diamond setting, at $50 each; 6 gold watches at $15 each; 4 sets teaspoons at $6 each. Make out the bill, and receipt it.

5. Reduce 3 pk. 5 qt. 1 pt. to the decimal of a bushel.

***

6. A drover sold 80 cows at $45 a head.   If 5 were killed by an accident, for how much per head must he sell the remainder to gain 20 % ?

7. A drover lost $2\frac{1}{2}$ % of his cattle by disease and $3\frac{1}{2}$ % by accident.   If his entire loss was 42, how many had he at first ?

8. What price must I mark silk that cost $2.25 a yard so that I may take off 5 % from the marked price and make 15 % on the cost ?

9. A stationer bought paper at $2.50 a ream, and sold it at 16¢ a quire. What per cent did he gain?

10. If I own .3 of a steamship and sell .5½ of my share for $3300, what is the value of ¾ of the ship at that rate?

XXXIX

Oral.

Rapidly answer :

$\frac{1}{2} + \frac{5}{8}$	$\frac{7}{8} - \frac{3}{4}$	$\frac{4}{5} \times \frac{3}{4}$	$4 \div \frac{2}{3}$
$\frac{2}{3} + \frac{1}{6}$	$\frac{5}{6} - \frac{1}{2}$	$\frac{1}{5} \times \frac{5}{6}$	$\frac{7}{8} \div 5$
$\frac{3}{4} + \frac{7}{8}$	$\frac{3}{4} - \frac{2}{3}$	$\frac{2}{3} \times \frac{6}{8}$	$\frac{3}{4} \div \frac{6}{7}$
$\frac{3}{4} + \frac{3}{8}$	$\frac{5}{8} - \frac{1}{2}$	$\frac{8}{8} \times \frac{3}{4}$	$1\frac{1}{2} \div 6$
$\frac{5}{6} + \frac{5}{12}$	$\frac{7}{8} - \frac{1}{6}$	$\frac{7}{8} \times \frac{4}{7}$	$1\frac{1}{2} \div 1$
$\frac{5}{8} + \frac{1}{4}$	$\frac{3}{4} - \frac{5}{8}$	$\frac{5}{8} \times \frac{3}{5}$	$1\frac{1}{4} \div \frac{1}{4}$

Tell what is meant by percentage. Name the terms used in percentage and define each.

What is meant by profit and loss? Name the terms used in profit and loss, and define each.

1. For how much must cheese bought at 20¢ a pound be sold to gain 20%?

2. I bought some goods for $10 and sold them at a loss of 20%. What was the selling price?

3. Robert paid $75 for a bicycle, but afterward sold it at a loss of 20%. For how much did he sell it?

4. A sofa was sold at auction for $20, and, having been repaired at a cost of 20%, was resold at an advance of 33⅓% on the entire cost. How much was gained?

5. By selling oil at 14¢ a gallon, a gain of 2¢ was made. What was the gain per cent?

Rapidly answer :

$\frac{4}{5} + \frac{5}{10}$	$\frac{4}{5} - \frac{2}{3}$	$\frac{1}{2} \times 2\frac{2}{3}$	$\frac{3}{4} \div 3$
$\frac{3}{4} + \frac{5}{6}$	$\frac{3}{4} - \frac{2}{3}$	$\frac{1}{2} \times 4\frac{2}{3}$	$3 \div \frac{3}{4}$
$\frac{2}{3} + \frac{5}{8}$	$\frac{5}{6} - \frac{5}{8}$	$\frac{1}{2} \times 6\frac{2}{3}$	$4 \div \frac{4}{5}$
$\frac{1}{2} + \frac{9}{10}$	$\frac{5}{8} - \frac{1}{4}$	$\frac{1}{3} \times 2\frac{1}{4}$	$4 \div 4\frac{4}{5}$
$\frac{5}{7} + \frac{1}{2}$	$\frac{3}{4} - \frac{2}{5}$	$\frac{1}{3} \times 1\frac{1}{2}$	$\frac{1}{4} \div 1\frac{1}{4}$
$\frac{5}{8} + \frac{3}{4}$	$\frac{3}{4} - \frac{3}{8}$	$\frac{1}{4} \times 1\frac{1}{3}$	$\frac{1}{5} \div 1\frac{1}{5}$

6. If I buy cloth at 40¢ a yard and sell it at an advance of $12\frac{1}{2}\%$, what is my selling price ?

7. Find the selling price of grain that cost $200 and was sold at a loss of 9 %.

8. Newspapers were sold for 5¢ each, which was at a gain of 25 %. How much was gained on 4 of the newspapers ?

9. Two motor cycles were sold for $99 each. On one there was a gain of 10 % and on the other there was a loss of 10 %. How much was paid for both motor cycles ?

10. What is the gain per cent on sugar bought at 6¢ a pound and sold at 8¢ a pound ?

Written.

1. An agent gained 8 % more by selling a house at a gain of $3780 than if he had gained only $2700. How much did the house cost ?

2. A tradesman who had drawn 40 % of his bank deposit purchased for 80 % of this amount a house valued at $5120. How much remained ?

3. A case of goods that cost 90¢ a yard is somewhat damaged. How must the goods be marked to take off 25 % from the marked price, and still receive what they cost ?

4. A fire destroyed ⅜ of a pile of lumber valued at $10000. What would be the loss to a man who owned 35 % of the entire pile?

5. A contractor built a row of 9 houses at a cost of $41760; he sold them at a gain of 35 %. What was the total gain, and the average price received for them?

---

6. Mr. Thornton offered his house for sale at an advance of 20 %; but afterward sold it for $6300, which was 12½ % less than his original offer. What was the cost of the house?

7. At what price should apples at $2.60 per barrel be marked to allow a reduction of 20 % and still sell at cost?

8. I sold my farm for $2400, losing 14⅔ %. How much did the farm cost me, and how much did I lose?

9. A merchant having $2150.38 in bank, deposited 7 % more. What amount had he then in the bank?

10. A speculator sold two houses, one for $9680, and the other for $3190. On the first he gained 37½ %, and on the second he lost 45 %. Did he gain or lose by the transaction, and how much?

XL

Oral.

Rapidly give the answers:

.15 + .2	.25 − .08	1.5 × 3	4.8 ÷ 6
.18 + .02	.14 − .05	1.8 × 4	.48 ÷ 6
.27 + .3	.26 − .002	2.5 × .5	.72 ÷ 3
.04 + .35	.02 − .005	.32 × .2	7.2 ÷ .03
.08 + .47	.28 − .8	.16 × .04	.36 ÷ 30

1. I had $150 and spent $23 for a suit of clothes and $67 for books. What per cent of my money had I left?

2. If olive oil is worth 37½¢ a pint, how many gallons of it can I buy for $6?

3. A man sold 32 sheep, which was 40% of the number he had left. How many sheep had he at first?

4. Two watches were sold for $55 each. On one 10% was gained and on the other 16⅔% was lost. How much did both together cost?

5. A picture dealer sold two pictures for $150 each. On one he gained 25%, and on the other he lost 25%. How much did he lose on both together?

Rapidly give the answers:

2.4 + .02	3.2 − .06	3.2 × 4	24 ÷ .03
.56 + .2	1.4 − .012	1.5 × .6	2.4 ÷ .3
.8 + .17	3.12 − .8	14 × .08	.24 ÷ 3
.182 + .6	.42 − .05	.12 × .11	.24 ÷ .003
14.5 + .02	.8 − .06	2.4 × .03	.024 ÷ 30

6. How must I sell goods that cost $56 so as to gain 37½%?

7. What per cent of a pound avoirdupois is 8 oz.?

8. If ¾ of a yard of calico costs 18¢, how much will 2⅝ yd. cost?

9. If ⅝ of a yard of muslin costs 15¢, how many yards can I buy for 96¢?

10. A piano marked to sell at $500 was sold for 20% less than the marked price. What was the selling price?

Written.

1. What must be the asking price of goods costing $32 that I may deduct 20 % from it and still gain 25 % on the cost?

2. I sold a typewriting machine for $66 and gained 10 %. What per cent should I have gained or lost if I had sold it for $65?

3. A man owning $\frac{7}{8}$ of a ship sold $12\frac{1}{2}$ % of his share for $4200. What was the value of the ship?

4. I sold two building lots for $1200 each. For one I received 25 % more than the cost and for the other 25 % less than the cost. What was the gain or loss on both?

5. The price of a sewing machine is $60 but it is sold for 5 % less than this price. What is the selling price?

6. How must I mark goods that cost me $120 so as to make 25 % after deducting 20 % from the marked price?

7. If I sell tea for 75¢ a pound at a profit of 20 %, how much shall I gain or lose per cent if I sell it at the rate of $56\frac{1}{4}$¢ a pound?

8. A man owning $\frac{3}{4}$ of a ship sold 25 % of his share for $2700. What was the value of the ship?

9. A speculator sold two houses for $6090 each. On one he gained 16 % and on the other he lost 16 %. How much did he gain or lose on both?

10. If a bill of $37.50 for goods is settled for 20 % less than its full amount, how much is paid on the bill?

THIRD MONTH

Rapid Drill:—daily.

The Fundamental Operations—to secure quickness and accuracy.

Common Fractions —various.

Decimal Fractions —various.

Denominate Numbers —various.

Tables —various.

Percentage —various.

Profit and Loss —various.

Commission and Brokerage. Finding the commission, when the amount of sales, money invested or collected, and the rate are given.

Finding the rate when the amount of sales, money invested or collected and the commission are given.

Finding the amount of sales, money invested or collected, when the commission or the net proceeds and the rate are given.

Problems. To apply the work of the month in common and decimal fractions, tables, percentage, profit and loss, commission and brokerage and the three time problems.

XLI.

Oral

Rapidly find the selling price :

Cost	Gain	Loss		Cost	Gain	Loss
$40	25 c	20 c		$60	20 c	45 c
$45	90 c	40 c		$72	25 c	$23\frac{1}{3}$ c
$48	$16\frac{2}{3}$ c	$72\frac{1}{2}$ c		$45	$33\frac{1}{3}$ c	$46\frac{2}{3}$ c
$3.50	$14\frac{2}{3}$ c	90 c		$75	$33\frac{1}{3}$ c	$16\frac{2}{3}$ c

What do we call the allowance made to an agent for selling goods to another?

What do we call the allowance made to a broker for buying or selling stocks, bills of exchange, real estate, etc.?

What name is given to the money received from a sale? to the money collected or invested?

To what term in percentage does the **amount of sales** or the **money invested** or **collected** correspond? To what term in percentage does the **commission** or **brokerage** correspond? To what term does the **net proceeds** correspond?

If the amount of the sales and the rate per cent of commission are known, how can the commission be found? the net proceeds or difference?

1. What is the commission on the purchase of a house for $6000 at 3 %?

2. Find the commission on the sale of a farm for $2000 at 5 %.

3. How much commission does a broker receive for buying 40 shares of stock at par ($100) at $\frac{1}{8}$ % commission?

4. A stove was sold for 30 % less than $45. What was the selling price?

5. If $27 will buy 9 lambs, how many lambs will $\frac{2}{3}$ of that money buy?

Rapidly find the selling price:

Cost	Gain	Loss	Cost	Gain	Loss
$42	$33\frac{1}{3}$ %	$16\frac{2}{3}$ %	$16	25 %	75 %
$40	20 %	$12\frac{1}{2}$ %	$25	20 %	40 %
$27	$33\frac{1}{3}$ %	$11\frac{1}{8}$ %	$14	50 %	$14\frac{2}{7}$ %
$35	$14\frac{2}{7}$ %	20 %	$24	25 %	$33\frac{1}{3}$ %

6. Find the commission on the sale of a house for $20000 at 5 %.

7. By selling a watch for $36, I gain 80 % of its value. What is its value ?

8. A man sells 24 books, which is 37½ % of what he has left. How many books had he at first ?

9. Of a flock of sheep, 25 % are in one field, 16⅔ % in a second, and the remainder, 14 sheep, are in a third field. How many sheep are there in the flock ?

10. What is the cost of goods sold for $480 at a gain of 20 % ?

Written.

1. What is the commission on a sale of cotton for $6450 at 1½ % ?

2. Find the commission on 225 bbl. of flour, at $7.60 per barrel, at 2 % .

3. What is an agent's commission on the purchase of 26 hogsheads of sugar, each weighing 5 cwt. 45 lb., at 7½¢ a pound, commission at ⅞ % ?

4. What is the commission on the purchase of a house for $1500 at 2½ % ?

5. What must be the asking price of goods that cost $3.60 in order to abate 25 % from the asking price and still gain 25 % ?

6. Find the commission on a sale of $5628.50 worth of cloth at 6¼ % .

7. What is the commission for selling 120 sets of furniture at $94½, the commission being ¼ % ?

8. My attorney collected a note for $1200 and charged 5½% commission. What amount did he pay me?

9. Goods costing $3750 were sold at a gain of 25%. What was the gain?

10. What is 8% of 25 lb. 14 oz.?

XLII

Oral.

Rapidly find the net proceeds:

Amount of Sale	Rate	Amount of Sale	Rate	Amount of Sale	Rate
$20	10%	$20	20%	$100	10%
$30	5%	$30	15%	$200	15%
$50	5%	$50	25%	$300	5%
$40	10%	$40	20%	$400	10%

1. What is ⅝% of $3200?

2. Six pints is what per cent of a gallon?

3. If I sell a village lot for $360 and lose 20%, how much did it cost me?

4. A grocer bought raisins at 12¢ a pound. How much must he charge for them in order to gain 25%?

5. I sold a book for 70¢ and lost 12½%. What would the selling price be to gain 12½%?

Rapidly find the net proceeds:

Amount of Sale	Rate	Amount of Sale	Rate	Amount of Sale	Rate
$100	3%	$100	13%	$2000	10%
$200	10%	$200	25%	$5000	3%
$300	10%	$300	20%	$10000	10%
$400	5%	$400	25%	$20000	10%

6. A grocer sold oranges at the rate of ½ ¢ each, gaining 50 %. How much did they cost him apiece?

7. A dealer sold 20 frames, which were 83⅓ % of the number he had left. How many had he at first?

8. What per cent of a pound is 4 oz. of silver?

9. A watch was sold for $240 at a gain of 20 %. What was the cost?

10. What is the difference between ⅔ of 24 and the number of which 9 is ¾?

Written.

1. An agent sells a consignment of flour for $7532.80 and then purchases 1840 bu. of wheat at $1.40 a bushel. His commission being 2¼ % for each transaction, what sum must he remit to the consignor?

2. In 1910 the entire population of New York City was 4766883. Of this number the native white element numbered 2741504 and the foreign born white element numbered 1820374. Find approximately the per cent each was of the total population.

3. If a man should sell his farm for $3600, 20 % of this money would be gain. Would he gain or lose, and what per cent, if he should sell his farm for $2975?

4. A merchant goes to New York with $1500. He first lays out 20 %, after which he expends $660. What per cent is his last purchase of the money that remained after his first purchase?

5. What number is that from which if 11 is subtracted ⅞ of the remainder will be 42?

6. Add : 42564
68247
51823
28546
98764
25439
87654
97645
32487

7. A commission merchant sold $2350 worth of produce at a commission of 3 %. How much did he make?

8. What commission must I pay an agent to sell a farm for me worth $12350 at ½ % ?

9. My salary is $800 a year. I pay 35 % of it for board, 11 % for clothing, 12 % for books, and 7 % for incidentals. What are my yearly expenses?

10. If 13½ bu. of wheat make 3 bbl. of flour, how many bushels of wheat will be required to make 40 bbl. of flour?

XLIII

Oral.

Rapidly add :

36	11	13	15	17	19	21	23	25	27	29	31	33	35	12
8	8	9	7	6	5	9	8	7	9	7	9	8	6	6
36	11	13	15	17	19	21	23	25	27	29	31	33	35	12

Tell how to find the rate per cent when the base and the percentage are given. What per cent of 8 is 7 ? of ½ is ¼ ? of ¼ is ½ ? A man gained $5 on a watch that cost him $50. What was his gain per cent? What corresponds to the base in Profit and Loss?

If a jeweler sold a watch for $60 and gained $10, what per cent did he gain? On what is the gain or the loss per cent calculated?

1. A commission merchant sold a lot for $1000 and received $50 commission. What was the rate of commission?

2. Find the rate of commission when $2 is paid for a sale of $10.

3. A speculator sold a farm for $3500 and received $350 for his services. What per cent did he receive?

4. At 5% commission, how much is paid to an agent for selling a horse for $200? How much does the owner receive?

5. The cost of a piano was $500. It was sold at a loss of 20%. What was the selling price?

Rapidly add:

31	30	29	28	42	44	28	41	28	42	56	38	47	29	15
3	9	8	7	8	9	8	9	7	8	4	6	9	8	9
31	30	29	38	32	34	17	38	19	34	27	42	52	27	21

6. What rate per cent commission does an agent receive who sells $20000 worth of goods for a commission of $500?

7. What is the rate of commission when the net proceeds of a sale of $800 is $600?

8. A merchant lost 20% by selling an overcoat for $16. How much did it cost him?

9. A farmer bought a mower for $48. He sold it at a loss of 25%. What was the selling price?

10. How much will $2\frac{1}{2}$ lb. of cheese cost, if $1\frac{1}{3}$ lb. cost 18¢?

Written.

1. What is the rate of commission if $31.50 is charged for collecting a debt of $1260 ?

2. What is the rate of commission if $162 is charged for selling $3600 worth of goods ?

3. I paid a broker $38.10 for buying 120 shares of railroad stock at $95¼ a share. What was the rate ?

4. If I bought goods for $30, how much must I ask for them so that I may abate 25 % from my price and still make 20 % ?

5. Mr. Weber owned ⅝ of the contents of a cigar store, and sold ⅔ of his share for $1800. What was the entire value ?

_____

6. An agent in Chicago remitted $3795.66 on a sale of 540 bbl. of flour at $7.25 a barrel. What was the rate of his commission ?

7. A real estate broker charged $182.34 for selling a factory for $12156. What was the rate of brokerage ?

8. My agent sells for me a town lot at $1080 and charges $81 commission. What per cent does he receive ?

9. A commission merchant receives and sells 12600 bu. of wheat, at $1.37 a bushel, on a commission of 3½ %. What is his commission ?

10. When goods cost $750, how much must I ask for them in order to deduct 20 % from my price and still make 6⅔ % ?

XLIV

Oral.

Rapidly make change from $1:

I spent 25¢; 34¢; 56¢; 72¢; 81¢; 15¢; 23¢; 36¢;
78¢; 54¢; 48¢; 31¢; 28¢; 63¢; 75¢; 52¢; 29¢;
17¢; 24¢; 41¢.

Supply the subtrahends:

473	453	376	482	378	627	423	562	375
?	?	?	?	?	?	?	?	?
251	146	198	150	129	278	156	128	256

1. What is the rate of commission if $35 is charged for selling a piece of property for $700?

2. Find the rate if a commission of $27 is charged for purchasing $5400 worth of stock.

3. What is the commission, at ⅛%, for buying 1000 bu. of wheat at 80¢ a bushel?

4. I gave $24 for a watch and ½ + ⅔ of this is 4 times what I gave for a chain. What was the cost of the chain?

5. What is .25 of .028?

Rapidly make change from $2:

I spent $0.74; $1.33; $1.24; $1.16; $1.22; $0.29;
$0.32; $1.56; $1.17; $1.48; $0.65; $0.42; $1.23;
$1.14; $0.28; $1.62; $1.02; $0.54; $0.29; $1.87.

Supply the subtrahends:

322	423	278	491	654	372	487	576	652
?	?	?	?	?	?	?	?	?
128	156	133	327	139	126	243	284	329

6. What is the per cent of commission if $72 is charged for selling $7200 worth of merchandise?

7. One quarter is what per cent of ⅜?

8. What is 8⅓ % of 96?

9. If .04 of an acre costs $16, how much will an acre cost?

10. If 1000 ft. of lumber cost $4 what is the price of 2375 ft.?

Written.

1. I paid a broker $27 brokerage to purchase for me $10800 worth of bank stock. What was the rate?

2. A commission merchant charged $17.28 for selling 640 bu. of potatoes at 60 ¢ a bushel. What rate did he charge?

3. A merchant pays $10050 for a stock of goods. He sells them at an advance of 33⅓ %. The expenses connected with the business are $1750. What is his net gain?

4. A man bought a farm of 160 A. at $32 per acre. He paid $200 for fencing, $150 for repair of buildings and $18 for improving the grounds. At what price per acre must the farm be sold to gain 25 % on the entire cost?

5. A carriage was sold for $525, which was 25 % gain on the cost. How much did it cost?

---

6. A broker charged $19 for selling $3800 worth of railroad stock. What per cent was the brokerage?

7. An administrator received $118.05 for settling an estate of $19675. What per cent was his commission?

8. When flour is selling at $4.50 a barrel a miller loses 10 %. What would be his gain per cent if he sold it at $5.50 a barrel?

9. A man sold two houses for $3750 each. On one he gained 20 %, and on the other he lost $37\frac{1}{2}$ %. Find the gain or loss on both.

10. A rectangular box is 8 ft. by 4 ft. by $5\frac{1}{2}$ ft. Find its volume.

XLV

Oral.

Rapidly find the commission :

Amount of Sale	Rate	Amount of Sale	Rate	Amount of Sale	Rate
$200	2 %	$350	$\frac{1}{3}$ %	$100	$2\frac{1}{2}$ %
$600	$\frac{1}{2}$ %	$250	3 %	$200	$1\frac{1}{2}$ %
$800	$\frac{1}{8}$ %	$450	4 %	$400	$1\frac{1}{4}$ %
$1000	$\frac{1}{5}$ %	$650	$\frac{1}{2}$ %	$600	$1\frac{1}{8}$ %

1. A real estate agent sold 8 cottages at $1000 each on a commission of $1\frac{1}{2}$ %. How much did he receive for each cottage sold?

2. A collector collects rents amounting to $1250 and pays $1200 to the owner. What rate of commission does he charge?

3. A cloak that cost $42 was sold at a loss of $16\frac{2}{3}$ %. What was the selling price?

4. A bicycle sold at a loss of 10 % brought $45. How much did it cost?

5. What is the area of a rectangle with a base of 50 in. and an altitude of 30 in.?

Rapidly find the commission:

Amount of Sale	Rate	Amount of Sale	Rate	Amount of Sale	Rate
$150	3 %	$650	$1\frac{1}{5}$ %	$1000	$\frac{1}{4}$ %
$175	2 %	$750	2 %	$2000	$\frac{1}{8}$ %
$300	$\frac{2}{3}$ %	$460	$1\frac{1}{2}$ %	$3000	$\frac{1}{5}$ %
$200	$2\frac{1}{2}$ %	$375	2 %	$4000	$1\frac{1}{2}$ %

6. An agent sold goods amounting to $960 and charged $1\frac{1}{4}$ % commission. What was his commission?

7. An agent received $15 for selling $7500 worth of goods. What per cent did he receive?

8. How shall I mark goods that cost $1.50 a yard, so that I may deduct $33\frac{1}{3}$ % from my marked price and still sell at cost?

9. 25 % of 8 is $\frac{1}{4}$ % of what number?

10. Find 375 % of $\frac{3}{5}$.

Written.

1. An agent sold 60 bales of cotton, each bale weighing 380 lb., at $11\frac{1}{2}$¢ a pound, on a commission of $2\frac{3}{4}$ %. What was his commission?

2. I paid $25.41 for collecting a debt of $2904. What was the rate?

3. For how much must goods be marked that cost 90¢ a yard in order to gain 30 % after deducting 10 % from the marked price?

4. A lady sold her piano for $297, thereby gaining 35 %. What would have been the gain per cent had she sold it for $33 more than she did?

5. I paid $118 for a set of furniture, which was $\frac{4}{5}$ % of the price of my house. What was the price of the house?

---

6. An agent sells $5472 worth of goods, charging $3\frac{1}{2}$ % commission and $1\frac{1}{4}$ % for insuring payment. How much will he send his employer?

7. An agent received $8.95 on a sale of goods amounting to $358. What was the rate?

8. A grocer lost 25¢ on a pound of indigo, which was $12\frac{1}{2}$ % of the cost. Find the cost and the selling price.

9. A farmer raised 2600 head of cattle. He kept $6\frac{1}{2}$ % and sold the remainder at $87\frac{3}{4}$ per head. How much did he receive?

10. How must I mark goods that cost $45 so as to gain 20 % after deducting 10 % from the marked price?

XLVI

Oral.

Rapidly find the rate:

Amount of Sale	Com-mission	Amount of Sale	Com-mission	Amount of Sale	Com-mission
$1000	$20	$3000	$60	$250	$5
$3500	$50	$8000	$100	$360	$4
$7500	$500	$6000	$200	$420	$6
$2000	$150	$4000	$50	$500	$5

Tell how to find the base when the percentage and the rate are given. $25 is 5 % of what number?

Tell how to find the cost when the gain or the loss and the rate are given. I sold a lot and lost $150, which was 50 % of the cost. How much did it cost? I sold another

and gained $150, which was 50 % of the cost. How much did the second lot cost?

Tell how to find the amount of sale when the commission and the rate per cent of commission are given. An agent received $50 for selling a house at 2 % commission. What was the amount of the sale?

1. Find the amount of sale when a commission of 2 % pays the agent $8.

2. A broker received $45 brokerage for selling stocks, which was ½ % of what was sold. What was the amount sold?

3. An agent received a commission of $160 at 2¾ %. How much money was invested?

4. What per cent of 5 is 6?

5. Some fancy ribbon was bought at 80¢ a yard and sold at $1.20. What per cent was gained?

Rapidly find the rate:

Amount of Sale	Commission	Amount of Sale	Commission	Amount of Sale	Commission
$600	$50	$150	$3	$6000	$40
$360	$6	$250	$4	$6400	$16
$400	$50	$350	$5	$5000	$25
$200	$30	$500	$4	$2400	$60

6. An agent received $400 for selling some property on a commission of 2 %. What was the amount of the sale?

7. I gave my agent $6 commission for selling a lot for me. His charge was 1½ %. Find the value of my lot.

8. A dealer sold a house for $200 and sent the owner $175. What was the rate of commission?

9. Cassimere marked at an advance of 75¢ on a yard yielded the merchant a profit of 25 %. For how much a yard was it sold?

10. Mr. James bought a cart for $60 and sold it at a gain of 25 %. The purchaser sold it at a loss of 20 %. How much did the latter receive for it?

Written.

1. What is the amount of the sale when a commission of $360 is charged at $2\frac{1}{2}$ % ?

2. What is the amount of the sale when the brokerage charged is $48 at $\frac{1}{4}$ % ?

3. What is the amount of the sale when a commission of 57.82\frac{1}{2}$ is charged at $4\frac{1}{2}$ % ?

4. An attorney's fee for collecting a debt at $2\frac{1}{2}$ % commission was $65. What was the debt?

5. A commission merchant sold 127 bbl. of flour for me at 7\frac{1}{2}$ per barrel. The cost of the freight, $12.85, together with the commission, amounted to $70. What was the rate of commission?

---

6. Find the amount of the sale when a commission of $24.52 is charged at 2 %.

7. When $56.25 brokerage is paid at 9 %, what is the amount of the sale?

8. When $171.78 is paid as commission at $3\frac{1}{2}$ %, what is the amount of the sale?

9. What per cent more than $\frac{5}{9}$ is $\frac{5}{6}$?

10. What per cent less than $\frac{20}{27}$ is $\frac{8}{15}$?

XLVII

Oral.

Rapidly multiply:

45	56	87	48	37	48	36	58	49	46	32	26	38
4	3	2	10	20	25	25	25	30	40	12	50	11

Tell a short way of multiplying by 25; of dividing by 25. How much must be taken from 10 times a number to leave 9 times the number? Tell a short way to multiply a number by 9. What is 10 times 23? $230 - 23 = ?$ What is 9 times 23? Multiply 54 by 9; 76 by 9; 84 by 9.

1. An agent received a commission of $24, which was 1 % of the amount of the sale. What was the amount of the sale?

2. A man invested $4000 and charged $2\frac{1}{2}$ % commission. What was his commission?

3. What is the difference between 25 % of $80 and $\frac{1}{4}$ % of $80?

4. A man sold 25 % of his wheat to one buyer, $12\frac{1}{2}$ % to a second, and had 350 bu. left. How many bushels were there in the crop?

5. What is the area of a rectangle whose base is 14 ft. and altitude 6 ft.?

———

Rapidly multiply:

72	42	56	82	16	32	64	44	40	52	36	19	32
25	25	25	25	25	25	25	25	25	25	25	9	9

6. A piano was marked $480 and sold at a discount of 10 %. What was the selling price?

7. I lost $3 by selling a desk for $18. What per cent did I lose?

8. What is the commission on 400 bbl. of fish at $5 a barrel, commission at 5 %?

9. I sold some goods for $30 and gained 20 %. How much did I gain?

10. Reduce $4\frac{9}{20}$ to a decimal.

Written.

1. Find the price per ton in each of the following and also the total cost per ton:

	Cost	No. of Tons	Cost per Ton
(a)	$ 74.50	$12\frac{1}{2}$	
(b)	1740.00	222	
(c)	490.00	$116\frac{2}{3}$	
(d)	1470.00	441	
(e)	407.00	66	
			=

2. An agent charged 2 % for selling a quantity of muslin and received $93.50 commission. What was the amount of the sale?

3. A commission merchant charged $25.50 commission, at $2\frac{1}{2}$ %, for selling 120 bbl. of flour. For how much did he sell it a barrel, and how much did he pay over to the owner?

4. The cheese made from the milk of 26 cows during a season was sold for $634.92 at $18\frac{1}{2}$¢ a pound. How many pounds were sold and what was the average per cow?

5. How many per cent less than 48 bu. is 40 bu. $3\frac{1}{8}$ pk.?

6. I have a rectangular farm 240 rd. long and 180 rd. wide, which is worth $75 an acre. What is the value of the farm?

7. I purchased 6000 bu. of wheat in Chicago at $1.37¼ a bushel and shipped it to my agent in Albany, who sold it at $1.62½ a bushel. How much did I make after paying $543 for expenses and a commission of $2\frac{2}{5}\%$?

8. Of what number is $\frac{3}{5}$ the $\frac{7}{8}$ part?

9. Find $14\frac{1}{2}\%$ of 6 yd. 2 ft. 8 in.

10. How much is $\frac{1}{2}$ of the fourth part of 7 times 224.56?

<center>

XLVIII

</center>

Oral.

Rapidly find the amount of sale:

Commission	Rate	Commission	Rate	Commission	Rate
$20	2%	$ 12	$\frac{1}{8}\%$	$16	2%
$50	$\frac{1}{2}\%$	$ 10	$\frac{1}{5}\%$	$30	3%
$60	$\frac{1}{4}\%$	$ 20	$\frac{2}{3}\%$	$25	$\frac{1}{2}\%$
$80	2%	$100	5%	$14	$\frac{1}{3}\%$

Tell how to find the commission when the amount of the sale and the rate are given. Tell how to find the net proceeds. What is meant by net proceeds? Are the net proceeds more or less than the amount of sale? The amount of sale being 100% and the commission 2%, what per cent is the net proceeds?

1. The net proceeds of a sale were $300 and the commission was 25%. What was the amount of the sale?*

---

* SUGGESTED·EXPLANATION: $25\% = \frac{1}{4}$.

<center>

Amt. of Sale	Commis- sion	Net Pro- ceeds

$\frac{4}{4}$ Amt. Sale $- \frac{1}{4}$ Amt. Sale $= \frac{3}{4}$ Amt. Sale.

</center>

Since $300 is $\frac{3}{4}$ of the amount of sale, $\frac{1}{4}$ of the amount of sale will be $\frac{1}{3}$ of $300, and $\frac{4}{4}$ will be $\frac{4}{3}$ of $300. $\frac{4}{3}$ of $300 = ?$

2. The net proceeds of a sale were $420 and the commission was $12\frac{1}{2}\%$. What was the amount of the sale?

3. After deducting his commission of 2% an agent sent his employer $980. What was the amount of the sale?

4. A dealer bought a second-hand sofa for $40, and after having spent 10% of the cost on repairs sold it at a gain of 25% on the whole cost. For how much did he sell it?

5. If a number decreased by $33\frac{1}{3}\%$ of itself equals 80, what is the number?

———

Rapidly find the amount of sale:

Commission	Rate	Commission	Rate	Commission	Rate
$ 99	3 %	$30	$\frac{2}{3}\%$	$120	$\frac{1}{4}\%$
$150	2 %	$50	$1\frac{1}{4}\%$	$140	$1\frac{1}{6}\%$
$200	$2\frac{1}{2}\%$	$40	$1\frac{1}{3}\%$	$240	$\frac{3}{4}\%$
$300	$1\frac{1}{2}\%$	$603	3 %	$160	$\frac{4}{5}\%$

6. When the net proceeds are $196 and the commission is 2%, what is the amount of the sale?

7. If a collector charged 12% commission and retained $24 as his fee, how much was collected?

8. The amount collected by an agent was $480, and his commission was $2\frac{1}{2}\%$. Find the commission and the net proceeds.

9. Multiply 3.6 by .002.

10. Divide 3.6 by .002.

Written.

1. What is the amount of the sale when the net proceeds are $3870, the commission being $3\frac{1}{4}\%$? *

2. Find the amount of the sale when the net proceeds are $5219.85 and the rate $2\frac{1}{4}\%$.

3. What is the amount of the sale when the net proceeds are $2422.50 and the rate of commission 5%?

4. An agent sold a consignment of goods at $2\frac{1}{2}\%$ commission, and he sent the owner $3381.30. What was the amount of the sale?

5. A's money is 50% more than B's money. What per cent less than B's money is A's money?

-----

6. What is the amount of the sale when the net proceeds are $2444.55 and the brokerage is $\frac{3}{4}\%$?

7. A tax receiver charged 5% commission and paid $4845 net proceeds into the town treasury. How much did he collect?

8. After retaining $2\frac{1}{2}\%$ for selling a consignment of flour my agent paid me $6664. What was the amount of sale and his commission?

9. A can do a piece of work in 7 da. and B the same work in 5 da. In what time can they both do it working together at these rates?

10. If $\frac{1}{4}$ of John's marbles equals $\frac{1}{7}$ of James's and both together have 44, how many has each?

* SUGGESTED METHOD :

$$\frac{\text{Net Pro.}}{100\% - \text{Rate}\%} = \text{Amt. of Sale.}$$

Net Proceeds $3870 = \begin{cases} \text{Amt. of Sale } 100\% = \frac{400}{400} \\ \text{Commission } \quad 3\frac{1}{4}\% = \frac{13}{400} \\ \qquad\qquad 96\frac{3}{4}\% = \frac{387}{400} \end{cases}$

XLIX

Oral.

Rapidly divide:

$3\overline{)129}$ $4\overline{)168}$ $5\overline{)205}$ $8\overline{)648}$ $9\overline{)549}$ $11\overline{)122}$

$10\overline{)456}$ $20\overline{)346}$ $30\overline{)273}$ $40\overline{)164}$ $50\overline{)275}$ $60\overline{)486}$

1. An agent charges a commission of 5 % on a sale of $190. How much does the agent collect?

2. A collector charges 2 % commission for collecting a bill of $65. How much does he pay over to his employer?

3. What is 900 % of $\frac{1}{900}$?

4. What per cent of $\frac{8}{8}$ is $3\frac{1}{8}$?

5. I sold a horse for $225 which was $112\frac{1}{2}$ % of what I paid for it. How much did it cost me?

Rapidly divide:

$6\overline{)426}$ $8\overline{)728}$ $4\overline{)808}$ $7\overline{)567}$ $9\overline{)909}$ $7\overline{)427}$

$10\overline{)250}$ $20\overline{)682}$ $30\overline{)366}$ $40\overline{)484}$ $50\overline{)565}$ $60\overline{)126}$

6. A real estate agent sold a house and lot for $3200. His commission was $2\frac{1}{2}$ %. How much did the owner receive?

7. An auctioneer received $15 for selling $500 worth of goods. What was his rate of commission?

8. Two and one fifth is what per cent of 1?

9. A boy sold his bicycle for $80, making 100 %. How much did it cost him?

10. How much per ton did coal cost that was sold for $6 a ton at a gain of 20 %?

Written.

1. My agent charged a commission of 5 % on $5250. How much did he receive ?

2. A commission merchant, who charged 1½ % commission and 3½ % for insurance, received $105.30.   What were the net proceeds ?

3. An agent sold a house for $8500 and charged 1⅞ % commission.   How much money did the owner receive ?

4. The commission on a sale of 4200 lb. of figs at 5¼ ¢ a pound was $17.64.   What was the rate per cent of commission ?

5. By selling cloth at $2.35 a yard 6 % was lost. What per cent would be gained by selling it at $3 ?

----

6. The net proceeds of a sale being $14140 and the rate 2½ %, what is the amount of the sale ?

7. A commission merchant sold goods amounting to $7468 at 5 % commission.   How much did he receive, and how much did he pay the owner ?

8. An auctioneer charged $405 for selling a sawmill at 1½ %.   For how much did he sell it, and how much did the owner receive ?

9. I bought a watch for $120.   How can I mark it so that after deducting 8 % from the marked price 15 % may be gained ?

10. My agent sold a house for $5000 and thereby gained 20 %.   Should I have gained or lost, and what per cent, had he sold it for $4000 ?

L

Oral.

Rapidly divide :

.8)$\overline{488}$ .04)$\overline{.008}$ .06)$\overline{486}$ .006)$\overline{48}$

40)$\overline{.002}$ .03)$\overline{123}$ 60)$\overline{4.86}$ .002)$\overline{5.64}$

.4)$\overline{15.2}$ 80)$\overline{.004}$ .06)$\overline{.426}$ 30)$\overline{.06}$

1. I bought a vase for $1\frac{1}{2}$ and sold it for $\frac{3}{4}$.   What was my loss per cent?

2. An agent sold a house for $6000 and received a commission of $150.   What was the rate?

3. How shall I mark goods that cost $1.40 a yard so that I may take from the marked price $12\frac{1}{2}\%$ and yet sell at cost?

4. If $\frac{1}{2}$ of an acre of land is sold for $\frac{3}{4}$ of the cost of an acre, what is the gain per cent?

5. I sell goods for $3.60 at a gain of 20%.   How much should I have received had I sold at a loss of 20%?

Rapidly divide :

8)$\overline{32.8}$ 60)$\overline{3.12}$ .05)$\overline{2.5}$ 60)$\overline{.306}$

90)$\overline{8.18}$ .5)$\overline{2.5}$ 70)$\overline{.49}$ .7)$\overline{.875}$

7)$\overline{1.47}$ 400)$\overline{.048}$ .005)$\overline{.25}$ 80)$\overline{.0016}$

6. Six is 120% of what number?

7. Sixteen quarts is 25% of how many bushels?

8. How shall I mark goods that cost 75¢ a yard so that I may deduct 25% and yet sell at cost?

9. A man sold a horse for $150 and lost $50.   What was the loss per cent?

10. A farmer sold sheep for $50, thereby losing $16\frac{2}{3}\%$. How much did the sheep cost?

Written.

1. An auctioneer sold a farm for \$12482 and charged $3\frac{1}{2}\%$ commission and \$50 for advertising it. What was his whole bill, and what were the net proceeds?

2. An agent paid his principal \$774.10 and retained \$117.90 as commission. What was the rate?

3. I paid an agent \$249.90 for buying 4760 bu. of wheat at \$1$\frac{1}{2}$ a bushel. What was the rate per cent of commission?

4. When the net proceeds are \$568.75 and the commission 9%, what is the amount of the sale?

5. A man sold corn at \$1 a bushel and gained 25%. What per cent would he have gained had he sold the corn for 88¢ a bushel?

6. An agent sells 15000 bu. of wheat at \$1.50 a bushel and charges $2\frac{1}{2}\%$ commission. How much money does he remit to the owner?

7. At 5% commission an agent received \$208.50 for buying wool. How much wool did he buy?

8. The net proceeds of a sale were \$970, and the commission was \$75. What was the rate per cent?

9. When the net proceeds are \$229.80 and the rate 3%, what is the amount of the sale?

10. A wagon cost \$60. At what price must it be marked in order that 20% may be gained after 20% is deducted from the marked price?

LI

Oral.

Rapidly find the number of which

56 is $\frac{7}{8}$	32 is $\frac{8}{9}$	52 is $\frac{1}{3}$	12 is $\frac{2}{3}$
49 is $\frac{7}{9}$	48 is $\frac{6}{7}$	54 is $\frac{1}{3}$	14 is $\frac{2}{7}$
36 is $\frac{4}{5}$	42 is $\frac{6}{11}$	22 is $\frac{11}{12}$	24 is $\frac{3}{4}$
72 is $\frac{8}{9}$	18 is $\frac{9}{11}$	41 is $\frac{1}{4}$	27 is $\frac{3}{4}$

1. Mr. Thompson sent his agent $1100 with which to buy sheep. How much is his commission at 2 % ?

2. How much does an agent make on a sale of $3150 at a commission of 10 % ?

3. A dealer sells 15 desks from his stock, which is 60 % of what he has left. How many desks had he at first ?

4. What is the rate of commission if $2 is paid for a sale of $8 ?

5. What is the amount of the sale when the net proceeds are $75 and the rate $16\frac{2}{3}$ % ?

———

Rapidly find the number of which

25 is $\frac{5}{6}$	40 is $\frac{8}{9}$	21 is $\frac{3}{4}$	35 is $\frac{5}{7}$
52 is $\frac{4}{5}$	24 is $\frac{2}{3}$	23 is $\frac{1}{5}$	42 is $\frac{7}{8}$
63 is $\frac{7}{9}$	36 is $\frac{4}{5}$	26 is $\frac{2}{5}$	48 is $\frac{3}{4}$
81 is $\frac{9}{10}$	48 is $\frac{1}{4}$	46 is $\frac{2}{3}$	58 is $\frac{2}{3}$

6. If I sold a book for 75¢ and gained 15¢, what per cent did I gain ?

7. If I sold a book for 75¢ and lost $16\frac{2}{3}$ %, how much did it cost ?

8. A grocer sold a dozen eggs for 30¢ and gained 25 %. What would the selling price have been had he lost 25 %?

9. I bought goods amounting to $600, and sold them for 5 % less.   What was the selling price of the goods?

10. What is the quotient obtained by dividing 4.8 by 60?

Written.

1. If $582.40 is 4 % more than a certain number, what is the number?

2. Four hundred dollars is 20 % less than a certain sum.   What is 20 % more than that sum?

3. Divide 7 by 3000.

4. Divide 24.08 by .04.

5. Divide .48 by 600.

———

6. An agent received $187 for selling $4400 worth of merchandise.   What was the rate?

7. An agent sells 40000 lb. of cotton at 12¢ per pound and 8400 bu. of wheat at 96¢ a bushel.   His commission being 2 %, how much does he remit?

8. I bought a home for $12\frac{1}{2}$ % less than $5600 and sold it for 20 % more than $4500.   How much did I gain?

9. A real estate agent collects the annual rent of a house and retains $13.25 as his commission at $2\frac{1}{2}$ %. What is the rental of the house?

10. Simplify $\dfrac{3\frac{3}{10} + 4\frac{4}{5}}{3\frac{2}{5} - 1\frac{1}{5}} \div \dfrac{\frac{3}{8} \times \frac{9}{10} \times \frac{2}{9}}{\frac{5}{7} \times \frac{3}{4} \times \frac{2}{5}}.$

LII

Oral.

Rapidly tell the number of which

17 is $12\frac{1}{2}\%$	27 is $37\frac{1}{2}\%$	24 is $88\frac{8}{9}\%$	26 is $66\frac{2}{3}\%$
28 is 25%	45 is $83\frac{1}{3}\%$	12 is $33\frac{1}{3}\%$	18 is $16\frac{2}{3}\%$
14 is 20%	21 is 75%	16 is $66\frac{2}{3}\%$	40 is $6\frac{1}{4}\%$
25 is $62\frac{1}{2}\%$	20 is $14\frac{2}{7}\%$	42 is $87\frac{1}{2}\%$	50 is $8\frac{1}{3}\%$

1. What is the amount of a bill of \$500 less 20 %?

2. What is the cost of an article, if by selling it for \$520 I gain 4 %?

3. If $2\frac{1}{4}$ lb. of tea cost \$3, how much will 3 lb. cost?

4. A grocer bought $10\frac{1}{4}$ lb. of butter at 24¢ a pound and sold them all for \$3. How much did he make?

5. I sold a harness for \$40 and lost 10 % on the sale. What was the loss per cent?

Rapidly tell the number of which

100 is 20%	250 is $62\frac{1}{2}\%$	400 is $44\frac{4}{9}\%$	500 is $8\frac{1}{3}\%$
120 is 75%	300 is $83\frac{1}{3}\%$	420 is $87\frac{1}{2}\%$	560 is 25%
150 is $33\frac{1}{3}\%$	320 is $88\frac{8}{9}\%$	480 is $16\frac{2}{3}\%$	240 is 20%
200 is $66\frac{2}{3}\%$	360 is 80%	450 is 20%	280 is $14\frac{2}{7}\%$

6. What is $3\frac{1}{3}\%$ of 100 bu. of wheat?

7. $\frac{3}{4}$ of 1 % of \$900 = ?

8. What per cent is equal to $\frac{3}{250}$?

9. How shall I mark goods that cost $2.40 a yard so that I may deduct $14\frac{2}{7}\%$ from the price marked and yet sell at cost?

10. What is the selling price of a wagon bought for $700, and sold for 30 % less?

Written.

1. What is the difference between $4\frac{5}{8}\%$ of $6000, and $6\frac{1}{4}\%$ of $4800?

2. If I sell, for 8¢ a yard, goods that cost me $3\frac{1}{2}$¢ a yard, what is my gain per cent?

3. If you pay $200 rent a month for your store, how many dollars' worth of goods must you sell each month to make this rent and average 20 % profit on your sales?

4. If the bread made from a barrel of flour weighs 30 % more than the flour, what is the weight of the bread?

5. Reduce $\frac{12}{850}$ to a decimal of three places.

---

6. A commission merchant sold 10 bbl. of pears for a farmer, at $5 a barrel. His commission was 10 % and $2.50 was charged for freight. What sum did he return to the farmer?

7. A clerk's salary was $1500 a year, and it was raised $250. What was the rate of increase?

8. A dealer bought $13\frac{3}{4}$ bbl. of sugar for $226.87½ and sold it for a profit of $3.37½ a barrel. What was the selling price?

9. A horse was sold for $144, which was a gain of 20 %. What was the cost?

10. The base being $800 and the rate $\frac{1}{4}\%$, find the percentage.

LIII

Oral.

Rapidly find the number than which

25 is $\frac{1}{4}$ more	27 is $\frac{1}{8}$ more	56 is $\frac{1}{8}$ more	36 is $\frac{1}{8}$ more
56 is $\frac{1}{6}$ more	28 is $\frac{1}{6}$ more	35 is $\frac{1}{4}$ more	42 is $\frac{1}{6}$ more
48 is $\frac{1}{7}$ more	60 is $\frac{1}{5}$ more	36 is $\frac{1}{5}$ more	80 is $\frac{1}{7}$ more
36 is $\frac{1}{2}$ more	80 is $\frac{1}{9}$ more	27 is $\frac{1}{2}$ more	24 is $\frac{1}{3}$ more

1. A grocer sold me 6 qt. 1 pt. of berries. What part of a peck was that?

2. What is the cost of 2 gal. 2 qt. of milk at 3¢ a pint?

3. What is $\frac{3}{4}\%$ of a ton in pounds?

4. What is $\frac{5}{8}\%$ of $1200?

5. Divide 48.26 by 100; by 200.

Rapidly find the number than which

45 is $\frac{2}{7}$ more	48 is $\frac{3}{8}$ more	72 is $\frac{1}{8}$ more	55 is $\frac{5}{6}$ more
44 is $\frac{8}{3}$ more	27 is $\frac{1}{2}$ more	66 is $\frac{3}{8}$ more	18 is $\frac{2}{7}$ more
81 is $\frac{1}{8}$ more	16 is $\frac{1}{7}$ more	39 is $\frac{5}{8}$ more	14 is $\frac{3}{4}$ more
14 is $\frac{2}{5}$ more	42 is $\frac{2}{5}$ more	52 is $\frac{1}{12}$ more	40 is $\frac{1}{3}$ more

6. To gain 20% for how much must butter that cost 30¢ a pound be sold?

7. A wagon that cost $49 was sold at a loss of $14\frac{2}{7}\%$. What was the selling price?

8. Three inches is what per cent of a foot?

9. If I sell for 75¢ that which cost me 50¢, what per cent do I gain?

10. How many acres of land are there in a lot 20 rd. long and 16 rd. wide?

Written.

1. I sold a horse for $250, and lost 20 %. How much would the selling price have been had I gained 20 % ?

2. A grocer had 350 bbl. of apples. He sold $28\frac{4}{7}$ % to one customer and 25 % of the remainder to another. How much was the rest worth at $2 a barrel ?

3. A man bequeathed $\frac{1}{3}$ of his estate to his wife, $\frac{1}{6}$ to each of three children, $\frac{1}{12}$ to his brother, and the rest, amounting to $1850, to a charitable institution. How much was the estate worth ?

4. I paid $25 per dozen for silk pocket handkerchiefs. For how much must I sell them apiece to make 20 % profit ?

5. A man drinks, on an average, 2 glasses of beer a day, costing 5¢ a glass, and smokes 3 cigars a day at 10¢ each. If he saved all this money for 20 years of 365 da. each, how many acres of land worth $15 per acre could he buy ?

---

6. A dealer sold 50 bbl. of flour for $250 and gained 25 %. Find the cost per barrel.

7. What is my commission on 75 bbl. of flour worth $4\frac{3}{4}$ each at 5 % ?

8. A jockey paid $875 for a horse and sold it so as to lose $250. What per cent did he lose ?

9. I gained $2\frac{1}{2}$ per barrel on a cargo of flour, which was 20 % of the value. What was the cost and the selling price ?

10. How much will 256 pt. of chestnuts cost at $1.75 a bushel ?

LIV

Oral.

Rapidly find the number of which

120 is 125 %	280 is 140 %	300 is 120 %
140 is 116⅔ %	180 is 112½ %	360 is 180 %
160 is 114²⁄₇ %	330 is 137½ %	400 is 111⅛ %
150 is 150 %	260 is 162½ %	340 is 106¼ %
240 is 160 %	390 is 108⅓ %	420 is 175 %

1. How much will .05 of an acre of land cost if .125 of an acre costs $15?

2. If 3 apples can be bought for 5¢, how many apples can be bought for $15?

3. I paid $1.20 for goods. How much must I mark them so as to gain 16⅔ % and abate 12½ % from the marked price?

4. 750 is what per cent of 12000?

5. I had $650 and spent ⅔ of it. How much had I left?

Rapidly find the number than which

480 is 33⅓ % more	240 is 25 % more	280 is 16⅔ % more
500 is 66⅔ % more	420 is 40 % more	450 is 12½ % more
320 is 14²⁄₇ % more	560 is 75 % more	480 is 33⅓ % more
220 is 83⅓ % more	270 is 50 % more	630 is 16⅔ % more
270 is 28⁴⁄₇ % more	560 is 60 % more	600 is 11⅑ % more

6. Reduce ⅔ of ₉⁄₁₀ to a decimal.

7. If 4 horses eat 2 T. of hay in 8 wk., how long will it take 5 horses to eat the same amount?

8. 12 % of 75 = what per cent of 108 ?

9. A man spent 25 % of his money and then 50 % of it, and put $\frac{1}{2}$ of the remainder away. If he put $120 away how much had he at first ?

10. What is .02 of .05 ? Explain.

Written.

1. Divide each number in the first column by the number on the same line in the second column, making your answers correct to two decimal places :

		Quotients
13.86	1.5	
49049.00	25025.	
1503.11	167.	
89.74	263.	
253.00	2875.	

2. I sold a man's house. I kept $350 of the money and gave him $14650. What per cent commission did I get ?

3. A broker sells 4000 bu. of wheat at $1.20 a bushel and charges 2 % commission. How much does he remit to his employer ?

4. I sold goods for $105.28 and lost 6 %. For how much must they have been sold to gain 25 % on the cost ?

5. A speculator invested $14000 in flour and sold it at a loss of $8\frac{1}{2}$ %. How much did he receive for his flour ?

6. An agent sold a lot of grain for $33150 on a commission of $2\frac{1}{2}$ %. He then invested the net proceeds in groceries, charging a commission of 2 % for buying. What was his total commission ?

7. How much is $18\frac{3}{4}\%$ of a cargo that weighs 416 T. 15 cwt. 20 lb.?

8. Out of a cask containing 47 gal. 2 qt. 1 pt. there leaked $6\frac{2}{3}\%$. How much leaked out?

9. A grain dealer bought 600 barrels of Western flour and sold $16\frac{2}{3}\%$ of it. How many barrels had he left?

10. A merchant sold goods at a profit of 8 % and cleared $1500. What was the cost of the goods?

LV

Oral.

Rapidly find the base:

Amount	Rate	Amount	Rate	Amount	Rate
$ 630	5 %	$4120	3 %	$3700	8 %
$1035	$3\frac{1}{2}\%$	$ 410	$2\frac{1}{2}\%$	$6150	$2\frac{1}{2}\%$
$1664	4 %	$1272	6 %	$1260	5 %
$1075	$7\frac{1}{2}\%$	$1575	5 %	$2060	3 %

1. A boy sold a sled for $1.40, and thereby lost $12\frac{1}{2}\%$. How much did the sled cost him?

2. A fancy basket was sold for $5 which was a gain of $66\frac{2}{3}\%$. What per cent would have been gained had it been sold for $4?

3. I sold a book for 42¢ and gained $16\frac{2}{3}\%$. How much money should I gain by selling it at a gain of 25 %?

4. What per cent of a cord of wood is 32 cu. ft.?

5. If $\frac{3}{5}$ of a ton of coal costs $4.50, how much will $\frac{1}{2}$ of a ton cost?

Rapidly find the base:

Amount	Rate	Amount	Rate	Amount	Rate
$2040	2 %	$3060	2 %	$5250	5 %
$4060	1½ %	$2050	2½ %	$8800	8 %
$3120	4 %	$5200	4 %	$6240	4 %
$6150	2½ %	$1080	8 %	$2030	1½ %

6. A boy sold a sled for $1.40 and lost 60¢. What was the loss per cent?

7. If I lose 10 % by selling calico at 18¢ a yard, for how much per yard must I sell it to gain 20 %?

8. Velvet sold at $5.50 a yard brings in a profit of 10 %. What is the cost of a yard?

9. Mr. Walker put $600 into a certain business and Mr. Brown put in $400. The profits were $500. What was the share of each?

10. If ⅝ of a yard of serge costs 20¢, how much will 2¼ yards cost?

Written.

1. An agent sold 25 A. of land at $150 an acre and charged ¼ % commission. Find his commission and the net proceeds.

2. A commission merchant sold 62 lawn mowers at $20 each, and 18 at $15 each. If, after deducting his commissions, he remitted $1057 to the manufacturer, what was the per cent of his commission?

3. A piano that cost $960 was sold for 12½ % less. What was the selling price?

4. A man bought a horse for $320, which was 20 % less than the real value, and sold it for 30 % more than the real value. What was the selling price of the horse?

5. If I pay $2 for 3 lb. of tea and sell 2 lb. for $3, what is my gain per cent?

6. An agent receives $7.25 commission on a sale of $200 worth of furniture. What rate per cent does he charge?

7. I sold a horse for $85 thereby losing 15 %. For how much should I have sold it to gain 20 %?

8. A farmer raised 7500 chickens. He kept $2\frac{1}{5}$ % of them and sold the remainder at 25 ¢ apiece. How much did he receive for what he sold?

9. An agent sells $7635 worth of goods, charging 2 % commission and $1\frac{1}{5}$ % for insuring payment. How much does he remit to his employer?

10. Reduce $\dfrac{2\frac{1}{2} \times \frac{3}{5}}{\frac{5}{8} \text{ of } 3\frac{1}{5}}$ to a decimal fraction.

LVI

· Oral.

Rapidly find the term marked "?":

Amount of Sale	Rate	Commission	Net Proceeds
$400	$2\frac{1}{2}$ %	?	?
?	?	$10	$490
?	?	$10	$70
?	?	$20	$140
$3000	5 %	?	?
?	6 %	?	$1128
$2500	8 %	?	?
?	?	$80	$320
?	?	$4	$60
?	10 %	$50	?

When is a common fraction said to be in its lowest terms?

What is the difference between a common fraction and a decimal fraction?

How is the denominator of a decimal fraction always distinguished?

1. I lost $80 by selling a horse at a loss of 20 %. Find the cost and the selling price.

2. What rate does a broker charge who takes $75 for selling $1550 worth of goods?

3. A tax collector received $160 for collecting taxes at 5 %. What amount did he collect?

4. A dealer sold a machine for $20 at a gain of $33\frac{1}{3}$ %. What per cent would he have gained had he sold it for $18?

5. If 20 % was gained when flour was sold at $6 a barrel, what per cent was gained when it was sold at $7 a barrel?

Rapidly find the term marked "?":

Amount of Sale	Rate	Commission	Net Proceeds
?	?	$5	$55
?	1 %	?	$198
$1200	?	$60	?
?	5 %	$80	?
?	3 %	?	$3880
?	10 %	?	$90
$6000	$2\frac{1}{2}$ %	?	?
?	5 %	$40	?
?	$3\frac{1}{2}$ %	?	$965
$1200	?	?	$1140

LII

Oral.

Rapidly tell the number of which

17 is $12\frac{1}{2}\%$	27 is $37\frac{1}{2}\%$	24 is $88\frac{8}{9}\%$	26 is $66\frac{2}{3}\%$
28 is 25%	45 is $83\frac{1}{3}\%$	12 is $33\frac{1}{3}\%$	18 is $16\frac{2}{3}\%$
14 is 20%	21 is 75%	16 is $66\frac{2}{3}\%$	40 is $6\frac{1}{4}\%$
25 is $62\frac{1}{2}\%$	20 is $14\frac{2}{7}\%$	42 is $87\frac{1}{2}\%$	50 is $8\frac{1}{3}\%$

1. What is the amount of a bill of \$500 less 20 %?

2. What is the cost of an article, if by selling it for \$520 I gain 4 %?

3. If $2\frac{1}{4}$ lb. of tea cost \$3, how much will 3 lb. cost?

4. A grocer bought $10\frac{1}{4}$ lb. of butter at 24¢ a pound and sold them all for \$3. How much did he make?

5. I sold a harness for \$40 and lost 10 % on the sale. What was the loss per cent?

———

Rapidly tell the number of which

100 is 20%	250 is $62\frac{1}{2}\%$	400 is $44\frac{4}{9}\%$	500 is $8\frac{1}{3}\%$
120 is 75%	300 is $83\frac{1}{3}\%$	420 is $87\frac{1}{2}\%$	560 is 25%
150 is $33\frac{1}{3}\%$	320 is $88\frac{8}{9}\%$	480 is $16\frac{2}{3}\%$	240 is 20%
200 is $66\frac{2}{3}\%$	360 is 80%	450 is 20%	280 is $14\frac{2}{7}\%$

6. What is $3\frac{1}{3}\%$ of 100 bu. of wheat?

7. $\frac{3}{4}$ of 1 % of \$900 = ?

8. What per cent is equal to $\frac{3}{250}$?

9. How shall I mark goods that cost $2.40 a yard so that I may deduct $14\frac{2}{7}\%$ from the price marked and yet sell at cost?

10. What is the selling price of a wagon bought for $700, and sold for 30% less?

Written.

1. What is the difference between $4\frac{5}{8}\%$ of $6000, and $6\frac{1}{4}\%$ of $4800?

2. If I sell, for $8¢$ a yard, goods that cost me $3\frac{1}{2}¢$ a yard, what is my gain per cent?

3. If you pay $200 rent a month for your store, how many dollars' worth of goods must you sell each month to make this rent and average 20% profit on your sales?

4. If the bread made from a barrel of flour weighs 30% more than the flour, what is the weight of the bread?

5. Reduce $\frac{12}{350}$ to a decimal of three places.

---

6. A commission merchant sold 10 bbl. of pears for a farmer, at $5 a barrel. His commission was 10% and $2.50 was charged for freight. What sum did he return to the farmer?

7. A clerk's salary was $1500 a year, and it was raised $250. What was the rate of increase?

8. A dealer bought $13\frac{3}{4}$ bbl. of sugar for 226.87\frac{1}{2}$ and sold it for a profit of 3.37\frac{1}{2}$ a barrel. What was the selling price?

9. A horse was sold for $144, which was a gain of 20%. What was the cost?

10. The base being $800 and the rate $\frac{1}{4}\%$, find the percentage.

LIII

Oral.

Rapidly find the number than which

25 is $\frac{1}{4}$ more	27 is $\frac{1}{8}$ more	56 is $\frac{1}{8}$ more	36 is $\frac{1}{8}$ more
56 is $\frac{1}{6}$ more	28 is $\frac{1}{4}$ more	35 is $\frac{1}{4}$ more	42 is $\frac{1}{6}$ more
48 is $\frac{1}{7}$ more	60 is $\frac{1}{5}$ more	36 is $\frac{1}{5}$ more	80 is $\frac{1}{7}$ more
36 is $\frac{1}{2}$ more	80 is $\frac{1}{9}$ more	27 is $\frac{1}{2}$ more	24 is $\frac{1}{3}$ more

1. A grocer sold me 6 qt. 1 pt. of berries. What part of a peck was that?

2. What is the cost of 2 gal. 2 qt. of milk at 3¢ a pint?

3. What is $\frac{3}{4}$ % of a ton in pounds?

4. What is $\frac{5}{8}$ % of $1200?

5. Divide 48.26 by 100; by 200.

Rapidly find the number than which

45 is $\frac{2}{7}$ more	48 is $\frac{3}{8}$ more	72 is $\frac{1}{8}$ more	55 is $\frac{5}{6}$ more
44 is $\frac{3}{8}$ more	27 is $\frac{1}{2}$ more	66 is $\frac{3}{8}$ more	18 is $\frac{2}{7}$ more
81 is $\frac{1}{8}$ more	16 is $\frac{1}{7}$ more	39 is $\frac{5}{8}$ more	14 is $\frac{3}{4}$ more
14 is $\frac{2}{5}$ more	42 is $\frac{2}{5}$ more	52 is $\frac{1}{12}$ more	40 is $\frac{1}{3}$ more

6. To gain 20 % for how much must butter that cost 30¢ a pound be sold?

7. A wagon that cost $49 was sold at a loss of 14$\frac{2}{7}$ %. What was the selling price?

8. Three inches is what per cent of a foot?

9. If I sell for 75¢ that which cost me 50¢, what per cent do I gain?

10. How many acres of land are there in a lot 20 rd. long and 16 rd. wide?

Written.

1. I sold a horse for $250, and lost 20 %. How much would the selling price have been had I gained 20 %?

2. A grocer had 350 bbl. of apples. He sold 28$\frac{4}{7}$ % to one customer and 25 % of the remainder to another. How much was the rest worth at $2 a barrel?

3. A man bequeathed $\frac{1}{3}$ of his estate to his wife, $\frac{1}{6}$ to each of three children, $\frac{1}{12}$ to his brother, and the rest, amounting to $1850, to a charitable institution. How much was the estate worth?

4. I paid $25 per dozen for silk pocket handkerchiefs. For how much must I sell them apiece to make 20 % profit?

5. A man drinks, on an average, 2 glasses of beer a day, costing 5¢ a glass, and smokes 3 cigars a day at 10¢ each. If he saved all this money for 20 years of 365 da. each, how many acres of land worth $15 per acre could he buy?

6. A dealer sold 50 bbl. of flour for $250 and gained 25 %. Find the cost per barrel.

7. What is my commission on 75 bbl. of flour worth 4\frac{3}{4}$ each at 5 %?

8. A jockey paid $875 for a horse and sold it so as to lose $250. What per cent did he lose?

9. I gained 2\frac{1}{2}$ per barrel on a cargo of flour, which was 20 % of the value. What was the cost and the selling price?

10. How much will 256 pt. of chestnuts cost at $1.75 a bushel?

LIV

Oral.

Rapidly find the number of which

120 is 125 %	280 is 140 %	300 is 120 %
140 is 116⅔ %	180 is 112½ %	360 is 180 %
160 is 114²⁄₇ %	330 is 137½ %	400 is 111⅑ %
150 is 150 %	260 is 162½ %	340 is 106¼ %
240 is 160 %	390 is 108⅓ %	420 is 175 %

1. How much will .05 of an acre of land cost if .125 of an acre costs $15?

2. If 3 apples can be bought for 5 ¢, how many apples can be bought for $15?

3. I paid $1.20 for goods. How much must I mark them so as to gain 16⅔ % and abate 12½ % from the marked price?

4. 750 is what per cent of 12000?

5. I had $650 and spent ⅔ of it. How much had I left?

———

Rapidly find the number than which

480 is 33⅓ % more	240 is 25 % more	280 is 16⅔ % more
500 is 66⅔ % more	420 is 40 % more	450 is 12½ % more
320 is 14²⁄₇ % more	560 is 75 % more	480 is 33⅓ % more
220 is 83⅓ % more	270 is 50 % more	630 is 16⅔ % more
270 is 28⁴⁄₇ % more	560 is 60 % more	600 is 11⅑ % more

6. Reduce ⅔ of ⁹⁄₁₀ to a decimal.

7. If 4 horses eat 2 T. of hay in 8 wk., how long will it take 5 horses to eat the same amount?

8. 12 % of 75 = what per cent of 108 ?

9. A man spent 25 % of his money and then 50 % of it, and put ½ of the remainder away. If he put $120 away how much had he at first ?

10. What is .02 of .05 ? Explain.

Written.

1. Divide each number in the first column by the number on the same line in the second column, making your answers correct to two decimal places :

		Quotients
13.86	1.5	
49049.00	25025.	
1503.11	167.	
89.74	263.	
253.00	2875.	

2. I sold a man's house. I kept $350 of the money and gave him $14650. What per cent commission did I get ?

3. A broker sells 4000 bu. of wheat at $1.20 a bushel and charges 2 % commission. How much does he remit to his employer ?

4. I sold goods for $105.28 and lost 6 %. For how much must they have been sold to gain 25 % on the cost ?

5. A speculator invested $14000 in flour and sold it at a loss of 8½ %. How much did he receive for his flour ?

6. An agent sold a lot of grain for $33150 on a commission of 2½ %. He then invested the net proceeds in groceries, charging a commission of 2 % for buying. What was his total commission ?

7. How much is $18\frac{3}{4}\%$ of a cargo that weighs 416 T. 15 cwt. 20 lb. ?

8. Out of a cask containing 47 gal. 2 qt. 1 pt. there leaked $6\frac{2}{3}\%$. How much leaked out ?

9. A grain dealer bought 600 barrels of Western flour and sold $16\frac{2}{3}\%$ of it. How many barrels had he left ?

10. A merchant sold goods at a profit of 8 % and cleared $1500. What was the cost of the goods?

LV

Oral.

Rapidly find the base:

Amount	Rate	Amount	Rate	Amount	Rate
$ 630	5%	$4120	3%	$3700	8%
$1035	$3\frac{1}{2}\%$	$ 410	$2\frac{1}{2}\%$	$6150	$2\frac{1}{2}\%$
$1664	4%	$1272	6%	$1260	5%
$1075	$7\frac{1}{2}\%$	$1575	5%	$2060	3%

1. A boy sold a sled for $1.40, and thereby lost $12\frac{1}{2}\%$. How much did the sled cost him ?

2. A fancy basket was sold for $5 which was a gain of $66\frac{2}{3}\%$. What per cent would have been gained had it been sold for $4 ?

3. I sold a book for 42 ¢ and gained $16\frac{2}{3}\%$. How much money should I gain by selling it at a gain of 25 % ?

4. What per cent of a cord of wood is 32 cu. ft. ?

5. If $\frac{3}{5}$ of a ton of coal costs $4.50, how much will $\frac{1}{2}$ of a ton cost ?

Rapidly find the base:

Amount	Rate	Amount	Rate	Amount	Rate
$2040	2 %	$3060	2 %	$5250	5 %
$4060	1½ %	$2050	2½ %	$8800	8 %
$3120	4 %	$5200	4 %	$6240	4 %
$6150	2½ %	$1080	8 %	$2030	1½ %

6. A boy sold a sled for $1.40 and lost 60¢. What was the loss per cent?

7. If I lose 10 % by selling calico at 18¢ a yard, for how much per yard must I sell it to gain 20 % ?

8. Velvet sold at $5.50 a yard brings in a profit of 10 %. What is the cost of a yard?

9. Mr. Walker put $600 into a certain business and Mr. Brown put in $400. The profits were $500. What was the share of each?

10. If ⅚ of a yard of serge costs 20¢, how much will 2¼ yards cost?

Written.

1. An agent sold 25 A. of land at $150 an acre and charged ¼ % commission. Find his commission and the net proceeds.

2. A commission merchant sold 62 lawn mowers at $20 each, and 18 at $15 each. If, after deducting his commissions, he remitted $1057 to the manufacturer, what was the per cent of his commission?

3. A piano that cost $960 was sold for 12½ % less. What was the selling price?

4. A man bought a horse for $320, which was 20 % less than the real value, and sold it for 30 % more than the real value. What was the selling price of the horse?

5. If I pay $2 for 3 lb. of tea and sell 2 lb. for $3, what is my gain per cent?

6. An agent receives $7.25 commission on a sale of $200 worth of furniture. What rate per cent does he charge?

7. I sold a horse for $85 thereby losing 15 %. For how much should I have sold it to gain 20 %?

8. A farmer raised 7500 chickens. He kept $2\frac{1}{5}$ % of them and sold the remainder at 25 ¢ apiece. How much did he receive for what he sold?

9. An agent sells $7635 worth of goods, charging 2 % commission and $1\frac{1}{5}$ % for insuring payment. How much does he remit to his employer?

10. Reduce $\dfrac{2\frac{1}{2} \times \frac{3}{5}}{\frac{5}{8} \text{ of } 3\frac{1}{5}}$ to a decimal fraction.

LVI

· **Oral.**

Rapidly find the term marked "?":

Amount of Sale	Rate	Commission	Net Proceeds
$400	$2\frac{1}{2}$ %	?	?
?	?	$10	$490
?	?	$10	$70
?	?	$20	$140
$3000	5 %	?	?
?	6 %	?	$1128
$2500	8 %	?	?
?	?	$80	$320
?	?	$4	$60
?	10 %	$50	?

When is a common fraction said to be in its lowest terms?

What is the difference between a common fraction and a decimal fraction?

How is the denominator of a decimal fraction always distinguished?

1. I lost $80 by selling a horse at a loss of 20 %. Find the cost and the selling price.

2. What rate does a broker charge who takes $75 for selling $1550 worth of goods?

3. A tax collector received $160 for collecting taxes at 5 %. What amount did he collect?

4. A dealer sold a machine for $20 at a gain of $33\frac{1}{3}$ %. What per cent would he have gained had he sold it for $18?

5. If 20 % was gained when flour was sold at $6 a barrel, what per cent was gained when it was sold at $7 a barrel?

Rapidly find the term marked "?":

Amount of Sale	Rate	Commission	Net Proceeds
?	?	$5	$55
?	1 %	?	$198
$1200	?	$60	?
?	5 %	$80	?
?	3 %	?	$3880
?	10 %	?	$90
$6000	$2\frac{1}{2}$ %	?	?
?	5 %	$40	?
?	$3\frac{1}{2}$ %	?	$965
$1200	?	?	$1140

6. When $480 of the $3200 received for an automobile is paid to the agent for selling it, what per cent commission does he receive?

7. John Calkins sold 100 packages of tea at 10¢ a package and received $2 commission. What per cent commission did he receive?

8. Last year Mr. Howard's salary was $3000. If he saved $8\frac{1}{3}$ % of it, how much money did he spend?

9. A grocer had a barrel containing 40 gal. of oil and 5 % of it leaked out. How many quarts of oil did he lose?

10. I sold $12\frac{1}{2}$ % of a flock of 320 sheep at $5 a head. How much did I receive for them?

Written.

1. A real estate broker bought 25 A. of land. He kept $\frac{3}{8}$ of it, used $\frac{1}{10}$ of it to make a street, and divided the rest into lots, each containing $\frac{5}{8}$ of an acre. How many lots were there?

2. I bought 1650 T. of ice at $12 a ton. One half of it melted and I sold the rest at $1 a hundredweight. What was my per cent of loss?

3. A man left $33\frac{1}{3}$ % of his property to his wife; 50 % of the remainder to his son; 75 % of what still remained to his daughter, and the balance, $120, to a faithful servant. How much did each receive?

4. A merchant bought 400 doz. eggs. When they were received he found that $3\frac{1}{2}$ % of them were broken. He sold the remainder at $3\frac{1}{2}$¢ each. How much did he receive for them?

5. An agent bought 100 bales of cotton at $125.25 a bale. What was his commission at $\frac{3}{8}$ % ?

---

6. In 1909 the land in Maine devoted to the production of hay was 1400000 A. and the amount raised was 1330000 T. What part of a ton was raised per acre? What was the value of the hay at the price for that year of $9.27 a ton?

7. A grocer bought 4 hhd. of sugar, each containing 1825 lb., at $6\frac{1}{4}$¢ a pound and paid 31.97\frac{1}{2}$ for freight, storage, and cartage. Allowing 5 % for leakage and waste, for how much per pound must he sell it to gain 25 % ?

8. What per cent of 46 gal. is 5 gal. 3 qt. ?

9. I paid an agent $6.70 cartage and $27 freight on $6300 worth of goods. His entire bill was $6680.20. What was his rate per cent commission?

10. The sum of $\dfrac{\frac{3}{5}\text{ of }\frac{5}{6}}{.5}$ and $\dfrac{\frac{4}{7}\text{ of }\frac{7}{12}}{\frac{4}{5}\text{ of }2.25}$ is equal to how many times their difference?

LVII

Oral.

Rapidly answer:

What is $\frac{5}{8}$ of 32? $\frac{4}{5}$ of 200? $\frac{3}{5}$ of 60? $\frac{1}{8}$ of 72? $\frac{3}{4}$ of 16? $\frac{3}{8}$ of 160? $\frac{2}{3}$ of 60? $\frac{1}{6}$ of 90? $\frac{1}{12}$ of 144? $\frac{5}{6}$ of 84?

What is 20 % of 600? 25 % of 420? 12$\frac{1}{2}$ % of 120? 37$\frac{1}{2}$ % of 320? 62$\frac{1}{2}$ % of 720? 16$\frac{2}{3}$ % of 150? 8$\frac{1}{3}$ % of 840? 83$\frac{1}{3}$ % of 120? 6$\frac{1}{4}$ % of 320? 14$\frac{2}{7}$ % of 560?

What is a minuend? What is a subtrahend? What is a quotient?

What is the effect of multiplying the denominator of a fraction by a whole number? Explain the reason of this.

1. A gardener planted 100 plants and $8\frac{1}{5}\%$ of them died. How many lived?

2. I spent $\frac{1}{3}$ and $\frac{1}{5}$ of my money and had $1500 left. How much money had I at first?

3. How much will 20 cases of Venetian cloth cost, each case containing 65 yd., at $\$\frac{4}{5}$ a yard?

4. A gave B 48$\cent$ and $\frac{5}{6}$ of this is 4 times as much as he had remaining. How much had he at first?

5. What is $\frac{1}{4}$ of .08?

———

Rapidly answer:

What is $\frac{5}{6}$ of 72? $\frac{9}{10}$ of 200? $\frac{5}{6}$ of 180? $\frac{7}{8}$ of 48? $\frac{5}{16}$ of 480? $\frac{5}{12}$ of 108? $\frac{7}{9}$ of 270? $\frac{7}{10}$ of 1000? $\frac{4}{9}$ of 540? $\frac{3}{7}$ of 210?

What is 50% of 250? 25% of 720? 60% of 500? $28\frac{4}{7}\%$ of 890? $22\frac{2}{9}\%$ of 360? 90% of 600? $6\frac{1}{4}\%$ of 640? $16\frac{2}{3}\%$ of 180? $33\frac{1}{3}\%$ of 270? 20% of 2000?

6. How many pecks, quarts, and pints are there in $\frac{2}{3}$ of a bushel?

7. James is 18 yr. old, and his age is $\frac{3}{7}$ of his father's age. How old is his father?

8. How much will $3\frac{3}{4}$ yd. of velvet cost if $\frac{7}{8}$ of a yard costs $\$3\frac{1}{2}$?

9. What part of 16 is $\frac{5}{8}$?

10. What is the sum of $\frac{5}{8}$ and 1.5?

Written.

1. A farmer raised 20% more wool this year than last. The amount raised last year was 1320 lb. How much was raised this year?

2. A merchant bought 275 bbl. of flour. After losing 20% of it he sold 25% of the remainder. What per cent of all remained?

3. A merchant bought 750 yd. of carpet, paying $1.75 a yard. His commission was $2\frac{1}{4}$% for buying, $\frac{1}{4}$% commission for a draft, and $12.50 for freight. What will be the amount of his bill?

4. I bought a house and lot for $11500 and sold it for $13640, after spending $350 on the house for repairs. What per cent did I make?

5. A can do a piece of work in 10 da., A and B can do the same work in 7 da. In how many days can B working alone do the work?

6. A man owning $\frac{1}{8}$ of a vessel sells 25% of his share for $3350.50. What is the value of the vessel?

7. An agent received $210 for making a sale of goods at $3\frac{1}{2}$%. What was the amount of the sale and the net proceeds?

8. Some cases of goods cost me $60. At what price must they be marked in order that after deducting 20% from the marked price, they may still show 20% profit?

9. When the net proceeds are $1201.48 and the commission 2%, what is the amount of the sale?

10. The sum of $\dfrac{\frac{2}{3} \text{ of } \frac{3}{4}}{\frac{1}{2}}$ and $\dfrac{\frac{2}{5} \text{ of } \frac{5}{6}}{\frac{2}{3} \text{ of } 4\frac{1}{2}}$ is equal to how many times their difference?

LVIII

Oral.

Rapidly find what part :

16 is of 48	27 is of 54	12 is of 108	16 is of 44
24 is of 36	72 is of 144	36 is of 48	32 is of 56
17 is of 68	14 is of 56	18 is of 54	14 is of 49
25 is of 75	24 is of 48	24 is of 72	28 is of 35

Given the length in feet, the width in feet, and the height in feet, tell how to find the number of cubic feet in the contents of a solid. A piece of marble is 2 ft. long, 1 ft. wide, and $1\frac{1}{2}$ ft. thick. How many cubic feet are there in it? How many cubic inches are there? What part of a cubic yard is there? Repeat the table of cubic measure.

1. How many cubic feet are equivalent to the amount of earth in a cellar 10 ft. long, 9 ft. wide, and 6 ft. deep? how many cubic yards or loads?

2. Find $\frac{1}{4}$ of $.08\frac{1}{2}$.

3. From $2\frac{1}{8}$ take $.06$.

4. If a pound of cheese is worth 18¢, how much will .5 of a pound be worth?

5. Forty-five dollars is what per cent of $12?

———

Rapidly find what part :

72 is of 108	18 is of 27	18 is of 48	24 is of 32
56 is of 84	35 is of 42	36 is of 63	36 is of 45
50 is of 250	63 is of 81	24 is of 44	12 is of 96
32 is of 48	16 is of 40	56 is of 63	54 is of 63

6. A boy lost $\frac{1}{4}$ and $\frac{1}{3}$ of his marbles and then had 60 left. How many marbles had he at first?

7. Divide $\frac{4}{5}$ by $\frac{2}{3}$; 26 by $\frac{2}{3}$; $\frac{3}{4}$ by 9.

8. How much will 820 yd. cost at $2.25 a yard?

9. I had $1600 and spent $\frac{3}{8}$ of it and then lost $66\frac{2}{3}\%$ of what was left. How much money did I lose?

10. How many cubic inches are there in 3 cu. ft.?

Written.

1. I sold two horses for $240 each, gaining 25% on one. What per cent did I lose on the other if I neither gained nor lost in the entire transaction? *

2. A dealer sells two automobiles for $3500 each, gaining $16\frac{2}{3}\%$ on one. What must his loss per cent on the second be in order that he may neither gain nor lose on the entire transaction?

3. An agent sells two houses for $3000 each, losing $16\frac{2}{3}\%$ on one. What per cent must he gain on the other so that he may neither gain nor lose on the entire transaction?

4. My agent sold two lots for me for $2100 each, losing $12\frac{1}{2}\%$ on one. What per cent must he gain on the second in order neither to gain nor lose on the transaction?

5. A grocer sold coffee at 24¢ a pound and lost 20% on the cost. He afterward sold a quantity of the same coffee for $390 and gained 30%. What quantity did he sell? At what price per pound?

---

* SUGGESTION: The cost of one is $\frac{4}{5}$ of $240, or $192. The cost of both (being the same as the selling price of both) is $480. $480 − $192 = $288, cost of the other.

Loss on second = $48; $\frac{48}{288}$ = ? %.

6. Add : $1234.56
2345.67
3456.78
4567.89
5678.90
476.81
1798.35
2854.11
265.93
1475.18
——————

7. Reduce to its simplest form the following expression :

$$\frac{\frac{3}{4} \text{ of } 2\frac{1}{4} \text{ of } \frac{2}{3}}{\frac{2}{7} \text{ of } 3\frac{1}{2}} \times \frac{3}{4} \div 4\frac{1}{2}.$$

8. A regiment went into battle with 1050 men and came out with 588 men. What per cent was lost ?

9. A merchant sold $6300 worth of goods and had 40 % of his stock left. How much was his entire stock worth ?

10. A merchant bought a quantity of paper muslin at 8¢ a yard and marked it so that he could deduct $9\frac{1}{11}$ % from the marked price and still gain 25 % on the cost. How did he mark it ?

LIX

Oral.

Rapidly add :

18	14	29	19	16	17	14	27	42	26	18	17	18
26	25	15	27	24	25	24	13	12	12	34	28	23
13	15	18	15	13	15	16	12	16	17	12	13	15

$14 + 7, \div 3, \times 2, + 1, \div 5, \times 6, + 2, - 10, + 2, \div 6 = ?$

1. If 80 % of a certain ore is silver, how much silver is there in 3500 lb. of ore ?

2. I bought a farm for $3000 and sold it a gain of $33\frac{1}{3}$ %. For how much did I sell it ?

3. A grocer on receiving 250 boxes of oranges found 20 % spoiled. How much would he receive for the remainder at $3 a box?

4. A lawyer charged $7\frac{1}{2}$ % for collecting a bill of $200. What was his fee?

5. How much will 42 eggs cost at 32¢ a dozen?

———

Rapidly add:

18	15	14	16	12	13	17	19	11	15	18	12	14
34	36	38	32	28	34	36	21	38	32	36	42	36
12	10	12	14	17	16	18	17	21	14	17	11	13

6. A man sold a harness for $15 and lost $16\frac{2}{3}$ %. How much would he have received had he sold it for a profit of $11\frac{1}{6}$ %?

7. By selling hay at $9 a ton, I lost 10 %. At what price must I sell it to gain 15 %?

8. By selling flour at $5.04 a barrel I lost $14\frac{2}{7}$ %. What was the cost?

9. What is $\frac{5}{8}$ % of $18?

10. If I sell a sleigh that cost me $25 for $15, what per cent do I lose?

Written.

1. A man bought $\frac{2}{3}$ of a vessel and sold $\frac{4}{5}$ of his share for $11700 which was 30 % more than the cost. What was the cost of the vessel?

2. By selling sugar at $15 per cwt. I gain 20 %. What per cent shall I gain by selling it at $13.50 per cwt.?

3. If I rent a house which cost $9000 for $900 a year and lay out $150 in repairs, what per cent of interest do I receive?

4. An agent collects 75 % of a bill of $775 and retains 8 % as his commission. How much does he remit?

5. A's age is double B's age, and B's age is three times C's age. If the sum of their ages is 70, how old is each?

---

6. I paid $56 for a sewing machine. How much must I ask for it that I may abate 5 % and sell at a gain of 25 %?

7. A merchant sells cloth at $3.60 a yard and gains 20 %. For how much must he sell it to lose 15 %?

8. A's money is 10 % more than B's money. What per cent less than B's money is A's money?

9. An agent received $990 for selling goods; his commission was $5\frac{1}{2}$ %. What was the amount of the sale?

10. A merchant expended for cloth $7850. He sold a certain number of yards for $5580, at $15 per yard, and gained on what he sold $1860. How many yards did he keep, and how much did he gain per yard on the cloth sold?

LX

Oral.

Rapidly add:

$\frac{2}{3} + \frac{5}{12}$	$\frac{5}{6} + \frac{2}{3}$	$\frac{5}{6} + \frac{11}{12}$	$\frac{3}{8} + \frac{17}{24}$
$\frac{3}{4} + \frac{7}{8}$	$\frac{5}{6} + \frac{7}{12}$	$\frac{11}{12} + \frac{3}{4}$	$\frac{5}{9} + \frac{5}{18}$
$\frac{5}{12} + \frac{5}{6}$	$\frac{2}{3} + \frac{7}{12}$	$\frac{3}{4} + \frac{2}{3}$	$\frac{2}{3} + \frac{5}{9}$
$\frac{7}{8} + \frac{5}{6}$	$\frac{3}{4} + \frac{5}{12}$	$\frac{17}{24} + \frac{3}{4}$	$\frac{7}{12} + \frac{11}{24}$

1. Butter was sold at a profit of 8¢ a pound or 25 %. What was the selling price?

2. A farmer sold a cow for $60, losing 25 %. What per cent would he have gained had he sold the cow for $100?

3. If $\frac{3}{8}$ of a yard of velvet costs $4.50, how much will $\frac{4}{5}$ of a yard cost?

4. A man sold a wagon for $420, which was 16 % less than it cost. How much did it cost?

.5. A hardware dealer paid $40 apiece for stoves. How much must he ask so that he may take off 20 % and still make 20 % on the cost?

Rapidly add:

$\frac{3}{4} + \frac{5}{6}$	$\frac{5}{12} + \frac{1}{6}$	$\frac{15}{36} + \frac{2}{9}$	$\frac{17}{18} + \frac{6}{9}$
$\frac{2}{3} + \frac{1}{4}$	$\frac{2}{15} + \frac{1}{3}$	$\frac{23}{36} + \frac{5}{9}$	$\frac{19}{24} + \frac{1}{4}$
$\frac{7}{9} + \frac{1}{2}$	$\frac{3}{20} + \frac{3}{10}$	$\frac{11}{24} + \frac{2}{3}$	$\frac{19}{24} + \frac{2}{3}$
$\frac{5}{8} + \frac{3}{4}$	$\frac{3}{10} + \frac{2}{5}$	$\frac{19}{24} + \frac{7}{12}$	$\frac{19}{24} + \frac{3}{8}$

6. If a man earns $1 in $\frac{3}{4}$ of a day how many dollars can he earn in 4 da. at this rate?

7. A man sold his house for 20 % above cost and made $400. How much did the property cost?

8. What per cent of 60 is $\frac{1}{2}$ % of 6000?

9. An agent sells a house for me at $2800 and charges $\frac{3}{4}$ % commission. What is his fee?

10. A real estate agent gets $80 for selling a house for $6000. What per cent commission does he charge?

Written.

1. An agent bought grain on which he paid $25.60 storage, and he charged $70.75 commission. The entire bill was $2926.35. What was the rate of commission?

2. A jeweler bought diamond rings at $120. How much must he ask for them, that he may deduct from the marked price 4 % and still make 20 %?

3. By selling my interest in a lead mine for $16872 I gain 14 %. How much should I have received had I lost 14 %?

4. If A's money is 25 % more than B's money, what per cent is B's money less than A's money?

5. After deducting his commission of 2 %, a commission merchant sent his principal $14700 as the net proceeds of a sale. What was the amount of the sale?

6. What is the commission for selling 12800 bu. of wheat at 75¢ per bushel, if the rate of commission is ⅛ %?

7. I bought a piano for $250. How much must I ask for it so that I may deduct 20 % from the marked price and still make a profit of 20 %?

8. Professor Winslow loses 16 % by selling his library for $960 less than it cost him. How much would he have received for it if he had sold it at a gain of 16 %?

9. Water expands 10 % in turning to ice. What per cent does ice contract when it melts?

10. An agent sent his employer $14700 and kept $300 as his commission. What rate per cent did he charge?

FOURTH MONTH

Rapid Drills — daily.

The Fundamental Operations — to secure quickness and accuracy.

Common Fractions — reviewed.

Decimal Fractions — reviewed.

Denominate Numbers — reviewed.

Tables — reviewed.

Bills — reviewed. **Indorsement of checks. Cash and personal accounts.**

Percentage — reviewed.

Profit and Loss — reviewed.

Commission — reviewed.

Interest. **For years and months.**

Problems. To cover the work of the month in common and decimal fractions, denominate numbers, tables, percentage, profit and loss, commission, and the type problems.

LXI

Oral.

Rapidly find the change from $5 :

$3.37; $2.69; $2.65; $1.69; $4.98; $3.33; $2.35; $1.23; $2.45; $1.25; $3.05; $3.15; $4.44; $2.20.

I hired a rowboat one summer while at Lake George, and the owner of the boat charged me $2 a week. Tell why he did so.

Mr. Brown owns a yacht, and he let me have the use of it one afternoon for $10. Tell why I had to pay him $10.

If you put $100 in the savings bank for one year, why does the bank at the end of the year add $4 to your account?

What does the bank call the $4 that it adds to your account?

What is **interest**? *

The bank pays you $4 on what amount? What do you call the $100?

What is the **principal**? †

If the bank pays you an interest of $4 for the use of $100, what is the **rate**? the **amount**?

What term in percentage corresponds to principal? to interest? to amount?

1. Find 6 % of $500. Tell the base; the rate; the percentage.

2. What is the interest on $500 at 6 % for 1 yr.? Tell the principal; the rate; the interest; the time.

What has been added in the second example that does not appear in the first? ‡

3. What is the interest of $200 at 1 % for 1 yr.? at 6 % for 1 yr.? at 6 % for 2 yr.? at 6 % for 3 yr.?

4. What is the interest of $300 for a year at 4 %? at 5 %? at 6 %? at 7 %? at 8 %?

5. At 5 %, how much must be paid for the use of $100 for 1 yr.? for 2 yr.? for 3 yr.? for 4 yr.? for 5 yr.?

---

* *Interest* is money paid for the use of money.

† The *principal* is the money on which interest is paid, or the money loaned, or the money earning money.

‡ The added element is *time*.

Rapidly find the missing term :

67	78	81	17	54	35	45	76	98	77
?	?	?	?	?	?	?	?	?	?
100	100	100	100	100	100	100	100	100	100

6. Find the interest of $400 at 6 % for 2 yr.*

7. Find the interest of $300 at 5 % for 3 yr.

8. What is the interest of $120 at 8 % for 2 yr.?

9. I pay $56 for a bicycle which I afterwards sell to gain $12\frac{1}{2}$ %. How much is my gain?

10. How much will $2\frac{1}{2}$ bu. of berries cost at 8 ¢ a quart?

Written.

1. Find the interest of $300 at 6 % for 4 yr.†

2. What is the interest of $1600 for 3 yr. at $7\frac{1}{2}$ % ?‡

3. Find the interest of $36000 for 5 yr. at 5 %.

4. If 9 bu. of wheat will make one barrel of flour, how many barrels of flour can be made from the wheat raised in the United States in 1910 (695443000 bu.)?

5. A boy bought a bicycle for $60, and after using it one year sold it at a loss of 30 %. The sum that he received for the old bicycle was $66\frac{2}{3}$ % of what he paid for a new one. What was the cost of the new bicycle?

---

* SUGGESTED EXPLANATION : Since the interest of $ 400 at 1 % for 1 year is $4, at 6 % for 1 year it is 6 times $4, or $24, and for 2 yr. it is twice $24.

† SUGGESTED METHOD : $\dfrac{\$\overset{3}{\cancel{300}}}{1} \times \dfrac{6}{\cancel{100}} \times \dfrac{4}{1} = \$72$ interest.

‡ SUGGESTED METHOD: $1600 × $\frac{15}{200}$ × 3 = ? Divide first by 100 by moving the decimal point two places to the left ; then divide by 2.

6. Find the interest of $560 for 4 yr. at 4 %.

7. What is the interest of $1080 for 6 yr. at 5 %?

8. Find the interest of $1120 for 5 yr. at $3\frac{1}{2}$ %.

9. A grain merchant found that the profits on corn sold during January were $180. His profits were 20 % of the cost of the corn. What was the amount of sales in corn during the month?

10. A man owns $\frac{3}{4}$ of a ship and sells $\frac{5}{8}$ of his share for $18000. What is the value of the remaining part of his share at the same rate? of the entire ship?

● LXII

Oral.

Rapidly multiply:

60	40	80	30	60	80	20	48	28	48
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$

A man started in business with $2000 and made 20 % of his money during the first year. How much was he worth at the end of the year? Tell what name is given to the $2000; to the 20 %; to the $400; to the $2400.

I put $200 in the bank and at the end of the year the bank allowed me interest at 4 %. How much had I in the bank at the end of the year? Tell what name is given to the $200; to the 4 %; to the $8; to the $208. Name the terms in interest that correspond to base; rate; percentage; amount. Define each term.

1. Find the interest of $600 at 5 % for 3 yr.

2. Find the amount of $400 at 6 % for 2 yr.

3. What is the amount of $500 at 4 % for 4 yr.?

4. How must I sell goods that cost $56 so as to gain 37½ %?

5. A horse was sold at a loss of $50, which was 10 % below cost. What was the cost?

Rapidly multiply:

15	24	27	30	39	12	15	27	24	33
1⅓	1⅓	1⅓	1⅓	1⅓	1⅔	1⅔	1⅔	1⅔	1⅔

6. What is the interest of $60 for 6 yr. at 5 %?

7. What is the interest of $40 for 4 yr. at 5 %?

8. What is the amount of $50 for 5 yr. at 8 %? *

9. What is the amount of $250 for 4 yr. at 5 %? (Explain.)

10. An article was sold for $6 at a gain of $2 on the cost. What was the gain per cent?

Written.

1. Find the amount of $500 for 6 yr. at 6 %.

2. What is the amount of $620 for 8 yr. at 4 %?

3. Find the amount of $715.50 for 2 yr. at 7½ %.

4. What is the amount of $2500 for 3 yr. at 6 %?

5. From a farm containing 375 acres there were sold 165 acres. What per cent of the farm remained unsold?

6. What is the amount of $5240 for 6 yr. at 5 %?

7. Find the interest of $3500 for 7 yr. at 8 %.

8. Find the amount of $8000 for 3 yr. at 4 %.

*SUGGESTED EXPLANATION: Since the interest of any principal for 5 yr. at 8 % is $\frac{8}{1} \times \frac{5}{100}$ of the principal or $\frac{2}{5}$ of the principal, the interest of $50 is $20, and the amount is the principal $50 + the interest $20.

9. A commission merchant sells 225 barrels of potatoes at $3.25 per barrel, and 316 barrels of apples at $4½ per barrel. What is the amount of his commission at 4½%?

10. An agent in Havana purchases $6720.80 worth of oranges at a commission of 5%. What is the amount of his commission?

LXIII

Oral.

Rapidly find the interest of:

$1 for 2 yr. at 6%	$1 for 2 yr. at 5%
$2 for 3 yr. at 6%	$2 for 3 yr. at 4%
$3 for 2 yr. at 6%	$3 for 4 yr. at 3%
$4 for 3 yr. at 6%	$4 for 2 yr. at 7%
$5 for 2 yr. at 6%	$5 for 3 yr. at 8%

1. What is the interest of $50 for 6 yr. at 4%?

2. What is the amount of $60 for 3 yr. at 4%?

3. A grocer sold corn at a profit of 12¢ a bushel, and thereby gained 20%. How much did it cost him?

4. A boy by selling newspapers at 5¢ each gained 66⅔%. How much did he pay for them?

5. What is the amount of sale when $24 commission is paid at ¼%?

Rapidly find the interest of:

$10 for 2 yr. at 6%	$10 for 3 yr. at 4%
$20 for 2 yr. at 6%	$20 for 2 yr. at 8%
$30 for 3 yr. at 5%	$30 for 4 yr. at 3%
$40 for 2 yr. at 6%	$40 for 5 yr. at 4%
$50 for 4 yr. at 5%	$50 for 6 yr. at 2%

6. What is the interest of $600 for 4 yr. at 7 %?

7. Find the amount of $200 for 6 yr. at 4 %.

8. Divide 6.25 by 10; by 100; by 1000.

9. Divide .48 by 60.

10. From a bank account of $1260, 16⅔ % was drawn. How much was left?

Written.

1. Find the interest of $6240 for 6 yr. at 7½ %.

2. Find the amount of $85.60 for 5 yr. at 6 %.

3. How much will 45 bu. 3 pk. 1 qt. of wheat cost at $1.75 a bushel?

4. How must cloth costing $4.50 a yard be marked that a merchant may deduct 16⅔ % from the marked price and still make 15 % profit?

5. What is the cost of 10 gal. 3 qt. of milk at 4¢ a pint?

6. Find the interest of $1296 for 8 yr. at 5 %.

7. What is the amount of $8440 for 6 yr. at 3½ %?

8. A dealer sold 47500 lb. of iron at $2.75 per hundredweight, and 4 % was taken off for cash. How much did the dealer receive?

9. Find the average age of four boys whose ages are 12⅔ yr., 13½ yr., 13¾ yr., and 11⅚ yr.

10. If 3 firkins of butter weigh respectively 8¼ lb., 12⅜ lb., and 14 15/16 lb., how much more do the first two together weigh than the third?

LXIV

Oral.

Rapidly find the amount of:

$2 for·1 yr. at 6 %	$5 for 2 yr. at 6 %
$1 for 2 yr. at 5 %	$6 for 3 yr. at 8 %
$3 for 2 yr. at 4 %	$4 for 4 yr. at 2 %
$4 for 3 yr. at 3 %	$3 for 5 yr. at 4 %
$2 for 4 yr. at 6 %	$8 for 2 yr. at 7 %

1. Mr. Clarke lent $500 at 6 % for 3 yr. How much interest was due him?

2. How much will $560 amount to in 4 yr. at 6 % interest?

3. Multiply 6.25 by 10; by 100; by 1000.

4. How much will 2½ bu. of berries cost at 8 ¢ a quart?

5. A boy has 20 ¢ in his pocket, which is 80 % of what he has at home. How much has he in all?

Rapidly find the amount of:

$20 for 2 yr. at 5 %	$10 for 8 yr. at 4 %
$30 for 1 yr. at 6 %	$20 for 6 yr. at 5 %
$10 for 5 yr. at 4 %	$30 for 5 yr. at 6 %
$40 for 3 yr. at 6 %	$40 for 4 yr. at 3 %
$50 for 4 yr. at 3 %	$50 for 3 yr. at 6 %

6. I borrowed $1000 for 1½ yr. at 6 %. How much interest had I to pay?

7. I borrowed $100 for 2 yr. at 5 %. How much had I to pay at the end of that time to pay back my loan with interest?

8. I bought a ream of legal cap paper for $2.40 and sold it at 20 ¢ a quire. How much did I gain?

9. Find the altitude (or the height) of a rectangle 14 ft. long which contains 140 sq. ft.

10. An agent buys for a customer 1000 bu. of wheat at 60 ¢ a bushel. What is the cost of the wheat to the customer, including ¼ ¢ per bushel to the agent for buying?

Written.

1. If I lend $1000 for 1½ yr. at 6 %, and borrow $1000 for 1½ yr. at 5 %, how much do I gain?

2. When Mr. Adams added a new department to his retail dry goods business, he borrowed $300 at 4 %, $500 at 8 %, and $1000 at 10 %. How much was his interest on the whole amount for one year? How much did he owe at the end of the year?

3. How many acres of land are there in a rectangular field 140 rd. long by 56 rd. wide?

4. At $15 an acre what is the value of an oblong piece of land 75 rd. long on the south side and 45 rd. long on the east side?

5. The list price of an engine is $320. If I buy it at a reduction of 10 %, and then sell it at a gain of 12½ % on the list price, what is my profit?

———

6. Find the interest of $560 for 1⅔ yr. at 6 %.

7. How much will $920 amount to at the end of 1½ yr. at 5 % interest?

8. A clock loses 40 sec. per day. What is its rate per cent of error per day?

9. What number increased by 16% of itself equals 1276?

10. .04 × 750 = ?

LXV

Oral.

Rapidly divide:

85 by 3	56 by $\frac{2}{3}$	6.5 by 10	75 by 1.5
97 by 6	18 by $\frac{3}{4}$	4.2 by 60	112 by 1.4
29 by 7	49 by $\frac{7}{8}$	4.8 by 30	108 by 1.2
38 by 4	27 by $\frac{3}{4}$	7.2 by 80	56 by 1.4

1. Mr. Watkins lends \$600 for 3 yr. at 6 %. How much is due him at the end of that time ?

2. Find the interest of \$800 for $2\frac{1}{2}$ yr. at 5 %.

3. A man borrowed \$10000 through an agent, paying him 1 % commission and \$50 for expenses. How much did the agent receive ? How much did the borrower receive ?

4. What decimal part of a ton is 90 lb. ?

5. My house is 4 rd. front and 5 rd. deep. What per cent of an acre of ground does it cover ?

———

Rapidly divide:

86 by 4	1 by $\frac{2}{3}$	92 by .4	4.5 by 9
92 by 8	1 by $\frac{4}{5}$	63 by .9	5.4 by 6
56 by 5	8 by $\frac{4}{7}$	72 by .8	6.9 by 3
63 by 7	16 by $\frac{4}{5}$	68 by .4	10.8 by 6

6. How much interest is due on \$200 lent for $1\frac{1}{2}$ yr. at 6 % ?

7. How much will \$500 amount to in 2 yr. at 4 % ?

8. A dealer sold a carriage for \$240, losing 20 %. Find the cost.

9. A commission merchant received $105 for selling butter at 5 % commission. How much did the butter bring?

10. How shall I mark gingham that costs 12¢ a yard to make 25 % profit?

Written.

1. What is the interest of $478 for 3⅛ yr. at 6 % ?

2. I mortgaged my house for $2800 at 5 %, and at the end of 4½ yr. I paid off both principal and the accumulated interest. How much did I pay ?

3. A lawyer collected 75 % of a note of $9500 and charged 6¼ % commission. What was his commission and the amount paid to his client ?

4. A lawyer received $34.37 for collecting a bill at 2½ %. What was the amount of the bill? Prove the answer.

5. If $1052.10 was paid for 7 T. of cheese, and the cheese was retailed at 10¢ a pound, how much was gained ?

6. What is the interest of $870 for 3 yr. at 4 % ?

7. Find the amount of $735 for 2 yr. at 5 %.

8. If 87½ % of a farm is worth $4900, how much is 62½ % of it worth ?

9. John Brown bought of Sloan and Company the following bill of goods :

<div align="center">

32 yd. carpet at $1.87½
24 stair pads at .16¼
36 yd. lining at .66⅔

</div>

Write this in bill form and receipt the bill.

10. Divide 7 by 3000.

LXVI

Oral.

Rapidly find the results:

$\frac{1}{2} + \frac{3}{5}$	$\frac{3}{5} - \frac{1}{2}$	$\frac{3}{5} \times \frac{5}{9}$	$\frac{15}{18} \div \frac{5}{3}$
$\frac{1}{8} + \frac{1}{6}$	$\frac{1}{7} - \frac{1}{9}$	$\frac{3}{4} \times \frac{8}{15}$	$\frac{27}{40} \div \frac{9}{20}$
$\frac{1}{4} + \frac{1}{7}$	$\frac{1}{4} - \frac{1}{7}$	$\frac{2}{7} \times \frac{14}{36}$	$\frac{48}{77} \div \frac{6}{11}$
$\frac{1}{7} + \frac{1}{8}$	$\frac{1}{5} - \frac{1}{8}$	$\frac{5}{8} \times \frac{16}{25}$	$\frac{5}{16} \div \frac{5}{8}$

How many months are there in a year?   One month is what part of a year? 2 mo. are what part of a year? 3 mo.? 4 mo.? 5 mo.? 6 mo.? 7 mo.? 8 mo? 9 mo.? 10 mo.? 11 mo.?

2 yr. 6 mo. reduced to years equal what? 3 yr. 4 mo.? 3 yr. 8 mo.? 2 yr. 9 mo.?

1. What is the interest of $1 for 2 yr. 6 mo. at 6 %?

2. Find the interest of $300 for 2 yr. 6 mo. at 6 %.

3. Divide 534.79 by 10; by 100.

4. A toy that cost 84¢ was sold for 96¢. What was the gain per cent?

5. What is $\frac{4}{5}$ % of $10?

———

Rapidly find the results:

$\frac{2}{3} + \frac{8}{9}$	$\frac{3}{4} - \frac{2}{3}$	$\frac{5}{8} \times \frac{3}{5}$	$\frac{3}{4} \div \frac{5}{8}$
$\frac{3}{4} + \frac{2}{7}$	$\frac{4}{5} - \frac{2}{7}$	$\frac{3}{7} \times \frac{7}{9}$	$\frac{9}{14} \div \frac{3}{7}$
$\frac{5}{8} + \frac{3}{5}$	$\frac{3}{4} - \frac{2}{7}$	$\frac{4}{9} \times \frac{5}{8}$	$\frac{7}{10} \div \frac{1}{6}$
$\frac{2}{7} + \frac{4}{9}$	$\frac{5}{8} - \frac{3}{5}$	$\frac{3}{8} \times \frac{5}{6}$	$\frac{28}{75} \div \frac{7}{15}$

6. Find the interest of $200 for 6 mo. at 6 %.

7. What is the amount of $120 for 1 yr. 4 mo. at 3 %?

8. If $\frac{3}{8}$ of a yard of ribbon costs $$\frac{3}{8}$, how much will $\frac{5}{8}$ of a yard cost?

9. Robert received ¾ of $1600 and James ⅛ more than Robert. How much did James receive?

10. By selling a horse for 135% of the cost, a man gains $70. How much did the horse cost?

Written.

1. What is the interest of $1800 for 4 yr. 2 mo. at 4½%?

2. Find the interest of $800 for 5 yr. 10 mo. at 6%.

3. What is the amount of $275 for 1 yr. 6 mo. at 5%?

4. Find the amount of $700 for 2 yr. 9 mo. at 5%.

5. Mrs. J. Walker, 1872 Fifth Ave., New York, bought of Mr. N. Adair, 203 West 23d St., New York, on March 15, 1912:

16	yd. silk	@ $2.25
6	pair hose	@ $ .62½
2	pair gloves	@ $1.35
13½	yd. cambric	@ $ .12
1	umbrella	@ $3.45

On March 18, 1912:

6 handkerchiefs	@ $ .12½
2 doz. buttons	@ $ .37½
15 yd. ribbon	@ $ .26

On March 23 she paid the bill in full. Make out the bill and receipt it.

6. Find the interest of $460 for 2 mo. at 8%.

7. What is the amount of $2100 for 1 yr. 8 mo. at 4%?

6. Find the interest of $560 for 4 yr. at 4 %.

7. What is the interest of $1080 for 6 yr. at 5 %?

8. Find the interest of $1120 for 5 yr. at $3\frac{1}{2}$ %.

9. A grain merchant found that the profits on corn sold during January were $180. His profits were 20 % of the cost of the corn. What was the amount of sales in corn during the month?

10. A man owns $\frac{3}{4}$ of a ship and sells $\frac{2}{3}$ of his share for $18000. What is the value of the remaining part of his share at the same rate? of the entire ship?

LXII

Oral.

Rapidly multiply:

60	40	80	30	60	80	20	48	28	48
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$

A man started in business with $2000 and made 20 % of his money during the first year. How much was he worth at the end of the year? Tell what name is given to the $2000; to the 20 %; to the $400; to the $2400.

I put $200 in the bank and at the end of the year the bank allowed me interest at 4 %. How much had I in the bank at the end of the year? Tell what name is given to the $200; to the 4 %; to the $8; to the $208. Name the terms in interest that correspond to base; rate; percentage; amount. Define each term.

1. Find the interest of $600 at 5 % for 3 yr.

2. Find the amount of $400 at 6 % for 2 yr.

3. What is the amount of $500 at 4 % for 4 yr.?

4. How must I sell goods that cost $56 so as to gain 37½%?

5. A horse was sold at a loss of $50, which was 10% below cost. What was the cost?

Rapidly multiply:

15	24	27	30	39	12	15	27	24	33
1⅓	1⅓	1⅓	1⅓	1⅓	1⅔	1⅔	1⅔	1⅔	1⅔

6. What is the interest of $60 for 6 yr. at 5%?

7. What is the interest of $40 for 4 yr. at 5%?

8. What is the amount of $50 for 5 yr. at 8%?*

9. What is the amount of $250 for 4 yr. at 5%? (Explain.)

10. An article was sold for $6 at a gain of $2 on the cost. What was the gain per cent?

Written.

1. Find the amount of $500 for 6 yr. at 6%.

2. What is the amount of $620 for 8 yr. at 4%?

3. Find the amount of $715.50 for 2 yr. at 7½%.

4. What is the amount of $2500 for 3 yr. at 6%?

5. From a farm containing 375 acres there were sold 165 acres. What per cent of the farm remained unsold?

---

6. What is the amount of $5240 for 6 yr. at 5%?

7. Find the interest of $3500 for 7 yr. at 8%.

8. Find the amount of $8000 for 3 yr. at 4%.

---

*SUGGESTED EXPLANATION: Since the interest of any principal for 5 yr. at 8% is $\frac{5}{1} \times \frac{8}{100}$ of the principal or ⅖ of the principal, the interest of $50 is $20, and the amount is the principal $50 + the interest $20.

9. A commission merchant sells·225 barrels of potatoes at $3.25 per barrel, and 316 barrels of apples at $4½ per barrel. What is the amount of his commission at 4½%?

10. An agent in Havana purchases $6720.80 worth of oranges at a commission of 5%. What is the amount of his commission?

LXIII

Oral.

Rapidly find the interest of:

$1 for 2 yr. at 6%	$1 for 2 yr. at 5%
$2 for 3 yr. at 6%	$2 for 3 yr. at 4%
$3 for 2 yr. at 6%	$3 for 4 yr. at 3%
$4 for 3 yr. at 6%	$4 for 2 yr. at 7%
$5 for 2 yr. at 6%	$5 for 3 yr. at 8%

1. What is the interest of $50 for 6 yr. at 4%?

2. What is the amount of $60 for 3 yr. at 4%?

3. A grocer sold corn at a profit of 12¢ a bushel, and thereby gained 20%. How much did it cost him?

4. A boy by selling newspapers at 5¢ each gained 66⅔%. How much did he pay for them?

5. What is the amount of sale when $24 commission is paid at ¼%?

Rapidly find the interest of:

$10 for 2 yr. at 6%	$10 for 3 yr. at 4%
$20 for 2 yr. at 6%	$20 for 2 yr. at 8%
$30 for 3 yr. at 5%	$30 for 4 yr. at 3%
$40 for 2 yr. at 6%	$40 for 5 yr. at 4%
$50 for 4 yr. at 5%	$50 for 6 yr. at 2%

6. What is the interest of $600 for 4 yr. at 7 %?

7. Find the amount of $200 for 6 yr. at 4 %.

8. Divide 6.25 by 10; by 100; by 1000.

9. Divide .48 by 60.

10. From a bank account of $1260, 16⅔ % was drawn. How much was left?

Written.

1. Find the interest of $6240 for 6 yr. at 7½ %.

2. Find the amount of $85.60 for 5 yr. at 6 %.

3. How much will 45 bu. 3 pk. 1 qt. of wheat cost at $1.75 a bushel?

4. How must cloth costing $4.50 a yard be marked that a merchant may deduct 16⅔ % from the marked price and still make 15 % profit?

5. What is the cost of 10 gal. 3 qt. of milk at 4¢ a pint?

_____

6. Find the interest of $1296 for 8 yr. at 5 %.

7. What is the amount of $8440 for 6 yr. at 3½ %?

8. A dealer sold 47500 lb. of iron at $2.75 per hundredweight, and 4 % was taken off for cash. How much did the dealer receive?

9. Find the average age of four boys whose ages are 12⅔ yr., 13½ yr., 13¾ yr., and 11⅚ yr.

10. If 3 firkins of butter weigh respectively 8¼ lb., 12⅜ lb., and 14¹⁵⁄₁₆ lb., how much more do the first two together weigh than the third?

6. What interest must I pay each year on a mortgage of $3000 at 5%?

7. What amount do I owe my friend from whom I borrowed $300 for 2 yr. at 6%?

8. Sixty square rods is what per cent of an acre?

9. How much will 1 qt. 1 pt. of molasses cost at 64¢ a gallon?

10. At 50¢ a hundredweight, how much will $\frac{1}{4}$ of a ton of hay cost?

Written.

1. Jan. 1, 1910, I borrowed $720 from Mr. Walker. If I pay 4% interest, what sum is due him on July 1, 1912?

2. A man borrowed $1080 Feb. 15, 1908, at 6%, and on July 15, 1912, he paid the amount due. How much was it?

3. Oct. 14, 1912, Mr. J. Brown bought of Clark & Co. 12 T. furnace coal @ $5.75 a ton, 7 T. stove coal @ $6.25, and 2 loads of pine wood @ $4.50. Make out the bill and receipt it. Write a check for the amount after deducting 5% for cash payment.

4. If I sell $\frac{3}{4}$ of an article for what $\frac{7}{8}$ of it cost, what per cent do I gain?

5. An agent bought 40 horses on commission at $4\frac{1}{2}$%. He paid $25 for keeping them and $50 for transportation. The total cost, including his commission, amounted to $345. How much apiece did he pay for the horses?

6. What is the interest of $540 for 2 yr. 8 mo. at 5 %? *

7. Find the amount of $3900 for 3 yr. 9 mo. at 6 %.

8. Divide .00375 by 625.5.

9. Divide 302404 by 874.

10. A man loses 10 % by selling his library for $927 less than it cost. How much would he have received for it had he gained 10 %?

LXIX

Oral.

Rapidly find the base :

Percentage	Rate	Percentage	Rate	Percentage	Rate
$90	$\frac{1}{4}$ %	$100	$1\frac{1}{2}$ %	$200	$\frac{2}{5}$ %
$80	$\frac{1}{3}$ %	$200	$1\frac{1}{4}$ %	$500	$\frac{5}{6}$ %
$60	$\frac{1}{5}$ %	$400	$1\frac{1}{3}$ %	$120	$\frac{3}{4}$ %
$30	$\frac{1}{2}$ %	$600	$1\frac{1}{5}$ %	$140	$\frac{7}{8}$ %
$70	$1\frac{3}{4}$ %	$300	$\frac{3}{4}$ %	$100	$1\frac{1}{4}$ %

1. How much will 3 pk. 3 qt. of potatoes cost at 16⊄ per half peck?

2. If you divide a barrel (196 lb.) of flour equally among 7 families, how many pounds will each receive?

3. An agent purchases $120 worth of goods. His commission is 2 %. What amount of commission does he receive?

4. How much will 4375 bricks cost at $8 per M?

---

* CANCELLATION METHOD BY YEARS :

$$\frac{\$540}{1} \times \frac{8}{3} \times \frac{5}{100} = ?$$

CANCELLATION METHOD BY MONTHS :

$$\frac{\$540 \times 32}{12} \times \frac{5}{100} = ?$$

5. A storm broke off 10 ft. less than $\frac{1}{8}$ of a tree, and there remained $\frac{3}{4}$ of the tree. What was the length of the tree? (Note that 10 ft. equals the difference between $\frac{3}{4}$ and $\frac{7}{8}$ of the tree. Explain by means of a diagram.)

Rapidly find the base:

Percentage	Rate	Percentage	Rate	Percentage	Rate
$60	$\frac{3}{5}\%$	$120	$1\frac{1}{8}\%$	$400	$\frac{2}{3}\%$
$90	$\frac{3}{4}\%$	$150	$1\frac{1}{4}\%$	$600	$\frac{1}{4}\%$
$50	$\frac{5}{8}\%$	$180	$1\frac{1}{2}\%$	$800	$\frac{1}{2}\%$
$70	$\frac{7}{8}\%$	$240	$1\frac{1}{5}\%$	$500	$\frac{5}{6}\%$
$80	$\frac{2}{3}\%$	$360	$1\frac{1}{8}\%$	$700	$\frac{1}{5}\%$

6. At the rate of 36 mi. per hour, how far can a train go in 24 hr.?

7. A milkman sold 3 qt. of milk for the price of a gallon. What per cent did he make?

8. I gained 16¢ by selling a book at $13\frac{1}{3}\%$ above cost. Find the cost.

9. Find $\frac{1}{6}\%$ of $60.

10. Divide .8 by 400.

Written.

1. Queen Victoria was born May 24, 1819. How old was she when she was crowned (June 28, 1836)?

2. A sum of money was loaned Jan. 25, 1902. What time elapsed before it was paid June 12, 1910?

3. How long is it since the Boston Massacre, which occurred March 5, 1770?

4. How many days are there from October 12 to Lincoln's Birthday (February 12)?

5. A man loses 10 % by selling his library for $360 less than it cost. How much would he have received for it had he gained 10 % ?

6. Queen Elizabeth was born Sept. 7, 1533, and died March 24, 1603. How old was she at the time of her death ?

7. A note dated Sept. 14, 1912, was paid Dec. 15, 1912. How many days did it run?

8. I sold flour that cost me $6.50 a barrel at an advance of 15 %. How much did I receive for $3\frac{1}{2}$ bbl.?

9. If $2\frac{1}{8}$ yd. of brocaded velvet cost $21\frac{1}{4}$, how much will $\frac{3}{4}$ yd. cost?

10. I sold a carriage for $184 and lost 8 %. What would be the selling price if I had sold it to gain 20 % ?

LXX

Oral.

Rapidly find the rate:

Base	Percentage	Base	Percentage	Base	Percentage
$1000	$40	$5600	$70	$25000	$500
$1500	$30	$4800	$16	$30000	$600
$2000	$10	$3600	$60	$32000	$400
$2400	$12	$2000	$20	$36000	$900
$3200	$80	$1500	$50	$48000	$120

1. What is the interest of $400 for 3 yr. 3 mo. at 6 % ?

2. Which is the greater, the interest of $100 for 3 yr. at 6 % or that of $100 for 4 yr. at 5 % ?

3. At $\frac{1}{8}$ ¢ a bushel, how much will an agent receive for selling 48000 bu. of corn ?

4. A shawl cost $5 and was sold for $8. Find the gain per cent.

5. A tenant pays his landlord 3 pk. out of every 5 bu. of wheat he raises. What per cent does he pay?

Rapidly find the rate:

Base	Percentage	Base	Percentage	Base	Percentage
$3000	$100	$8000	$200	$4200	$140
$4000	$120	$9000	$300	$4500	$150
$5000	$150	$2700	$900	$4800	$300
$6000	$300	$2800	$700	$5400	$600
$7000	$100	$3600	$300	$7200	$120

6. Find the interest of $300 at 4 % for 8 mo.

7. What is the amount of $200 for 1 yr. 3 mo. at 6 %?

8. What is $\frac{3}{5}$ % of $5?

9. If $\frac{3}{8}$ of a yard of muslin costs 6 ¢, how many yards can be bought for 64 ¢? (Explain.)

10. What per cent does a man lose who buys a saddle for $12 and sells it for $10?

Written.

1. Mr. Stern bought a house for $4800. He had $1300 cash on hand and borrowed the rest from a friend to whom he agreed to pay interest at 5 % per annum. How much interest did he pay each year?

2. What is the amount of $2500 at $3\frac{1}{2}$ % for 10 yr.?

3. A merchant paid $87\frac{1}{2}$ ¢ a yard for a case of linens, which proved to be slightly damaged. How must he mark it a yard that he may deduct 25 % and still sell at cost?

4. Goods were sold for $60.90 by which $8\frac{3}{4}\%$ was gained. How much did the goods cost?

5. Mr. Watson invested $2560 in stocks and made a profit of $384. What was his gain per cent?

---

6. What is the interest of $3600 at 5% for 3 yr. 8 mo.?

7. Find the amount of $2700 at 6% for 2 yr. 6 mo. Write a check for the amount payable to Mr. James Warner.

8. I bought a house for $6750. For how much must I sell it to gain $12\frac{1}{2}\%$?

9. 10 mi. 316 rd. is 75% of how many rods?

10. A man sold 24 horses for $150 each. On $\frac{1}{2}$ of them he gained $\frac{3}{10}$ of what they cost, and on the remainder he lost $\frac{1}{5}$ of what they cost. What was his entire gain or loss?

LXXI

Oral.

Rapidly add:

31	42	53	64	75	86	97	30	41	52	63	74	85
5	6	7	8	9	5	5	7	8	9	5	5	6
21	32	43	54	65	76	87	98	20	31	42	53	64

1. If $4.80 will buy $\frac{4}{5}$ of a ton of coal, how many tons will $7.20 buy? (Explain.)

2. A sheep that cost $7 was sold for $8. What was the per cent of gain?

3. A boy misspells 55 words out of 66. What per cent has he wrong?

4. What is $\frac{1}{8}$ % of $40 ?

5. A book that cost $2 was sold at a loss of 50¢. What per cent was lost?

Rapidly add:

98	20	31	42	53	64	86	97	22	23	44	55	66
6	7	8	9	4	5	4	5	6	7	8	9	4
77	88	99	23	24	45	67	78	89	90	24	35	45

6. A man bought a cow for $20.   For how much must he sell it to gain 5 % ?

7. A tailor sold a coat at a profit of $3, and gained 30 %.   How much did it cost him ?

8. A lady sold a cart for $24, which was 60 % of its first cost.   What was the cost?

9. If I sell for $15 a sleigh that cost me $25, what per cent do I lose ?

10. If 4 men can lay a brick wall in 5 da., how long will it take 8 men, working at the same rate, to lay it ?

Written.

NOTE. In marking the cost of goods some merchants take a word, a phrase, or a sentence consisting of ten different letters and let each letter in succession represent one of the figures.   By so doing they can conceal the cost or the selling price from all who do not know the key.   For example: Suppose the key is " Now be quick " $\frac{n-o-w-b-e-q-u-i-c-k}{1-2-3-4-5-6-7-8-9-0}$.   If the cost of an article is $3.65, and the selling price is $4.20, it will be marked $\frac{\text{w.q e,}}{\text{b.o k,}}$ Cost S. P.

1. Using the above key, how must you mark cloth that cost $3.75 per yard, in order to gain 20 % ?

2. Mark the selling price of goods that cost $2.40 to gain 30%, the key being "Pay me first."

3. Mark the cost and selling price from the key "Pay me first" of an article that cost $1.40 and sold at a gain of 20%.

4. A man sold two farms for $6000 each. On one he gained 25% and on the other he lost 25%. Did he gain or lose by the transaction, and how much?

5. Mr. Gray gained 12½% by selling a house for $850 more than it cost him. How much did Mr. Gray pay for the house?

6. Add:

68472
45138
45763
28947
81764
38724
72386
56872
93864
87982

7. From the key word "Charleston" find the cost mark and the selling price mark of ties bought for $4.20 a dozen and sold to gain 20%.

8. Divide 875432 by 387.

9. A produce buyer bought 250 bbl. of apples at $2.12½ per barrel, and sold them at a profit of 12½%. How much did he gain?

10. Find the total population of the following states: New York, 9113614; Pennsylvania, 7665111; Illinois, 5638591; Ohio, 4767121; Texas, 3896542.

LXXII

Oral.

Rapidly find the difference:

301	420	630	530	602	480	440	832	460	222
231	290	618	260	536	270	360	321	250	163

In keeping a **cash account** write the receipts on the left side and the amounts paid out on the right side.   The left side may be marked **Dr.** and is called the **debit** column, and the right side may be marked **Cr.** and is called the **credit** column.

FIRST FORM

Dr.				CASH			*Cr.*		
1918					1918				
Apr. 1	To Cash on hand	$120	30		Apr. 3	By Shoes		$ 3	50
" 8	" James Brown	40	56		" 10	" Subscription		2	00
" 15	" Int. on Bonds	45	00		" 15	" Groceries		17	84
" 27	" Pension	12	00		" 21	" Meat		8	50
					" 28	" Coat		15	00
					" 31	" Balance		171	02
		217	86					217	86
May 1	To Cash on hand	$171	02						

SECOND FORM

	CASH	*Dr.*		*Cr.*	
1918					
Apr. 1	To Cash on hand	$120	30		
" 3	By Shoes			$ 3	50
" 8	To James Brown	40	56		
" 10	By Subscription			2	00
" 15	To Int. on Bonds	45	00		
" 15	By Groceries			17	84
" 21	" Meat			8	50
" 27	To Pension	12	00		
" 28	By Coat			15	00
" 31	" Balance			171	02
		217	86	217	86
May 1	To Cash on hand	$171	02		

1. A girl received $10 for a Christmas gift. She spent $1 the next day for a pair of gloves and $3 for a fountain pen. She received $5 more for a New Year's gift. How much money had she on Jan. 1? In her cash account, which items would be placed in the debit column? in the credit·column?

2. How many inches are there in 5 ft. 4 in. ?

3. How many feet are there in 2⅔ yd. ?

4. James is 54 in. tall. How many feet tall is he?

5. If 8 men can do a piece of work in 10 da., how many men will it take to do it in 16 da. ?

Rapidly find the difference:

367	276	440	525	673	822	854	778	671	562
288	199	376	438	599	767	798	289	376	483

6. Find $33\frac{1}{3}$ % of $369\frac{3}{8}$ A.

7. What per cent is gained on an article bought for 25 ¢ and sold for 36 ¢ ?

8. A grocer asked 30 % above cost for his fruit, but took 30 % less than he asked. What per cent did he lose?

9. If I sold a horse for $120 and gained 2 %, how much did it cost ?

10. What per cent of ½ is ⅖ ? of ⅖ is ½ ?

Written.

1. Write the cash account of Robert Brown : Receipts : Jan. 1, 1913, cash on hand, $1.52; Jan. 4, monthly allowance, $5 ; Jan. 27, birthday present, $10. Amounts paid out: Jan. 2, flowers, $1.25 ; Jan. 7, book, $1.13 ; Jan. 16, fruit, $.65 ; Jan. 27, theater, $.75.

2. Reduce 921024 cu. in. to cubic yards, etc.

3. My key for marking goods is "Now be quick." How much must I receive for hats marked o.i k, to gain 25 %?

4. Find the interest of $684 for 3 yr. 4 mo. at 7 %.

5. A farmer borrowed $300 for 2 yr. 4 mo. at 5 %. What amount will be due the lender at the end of that time?

6. Reduce 3 pk. 7 qt. 1 pt. to the decimal of a bushel.

7. Caps bought at $8.40 per dozen are sold at retail for 25 % above cost. Mark the cost and the selling price from the key "Cash profit."

8. What is the interest of $960 from May 15, 1911, to Oct. 15, 1913, at 6 %?

9. What must be the marked price of goods costing $1.50 per yard to gain 20 %, after dropping 10 % from the marked price?

10. Divide $1\frac{2}{3}$ by $\frac{\frac{2}{3}}{\frac{2}{15}}$.

LXXIII

Oral.

Rapidly multiply:

28	95	65	75	93	72	61	84	56	29	28	63	52
4	5	6	7	8	9	7	2	9	3	6	7	4

Add by 7's to 105; subtract by 6's from 90.

1. A farmer sold 40 bu. of potatoes at 75¢ a bushel. If this was 25% of his crop, how many bushels had he left?

2. A boy had $ 5. He spent 50 ¢ for a penknife, and $ 1 for a book. Then he earned $ 1 and received $ 2 as a gift. Find his balance.

3. A boy sold popcorn at the rate of 15 ¢ a quart, and made a profit of 50 %. How much per bushel did he pay for the popcorn ?

4. A grocer sold a bill of goods for $ 20, of which 33⅓ % was gain. What was the cost ?

5. A merchant by selling cloth at $ 2.50 a yard, gained 25 %. For how much a yard should he sell it to gain 50 % ?

_____

Rapidly multiply :

87	58	94	96	98	53	65	82	36	52	82	58	67
3	2	4	5	6	8	7	8	4	3	7	4	5

Add by 8's to 128. Subtract by 7's from 112; by 6's from 102.

6. A farmer sold 2 T. of hay for $ 36, losing 25 % on them. How much did one ton cost him ?

7. By selling a village lot for 16⅔ % profit I cleared $ 100. How much did it cost me ?

8. An agent sent to me $ 950, retaining his commission of $ 50. How much did he collect, and what was the rate of his commission ?

9. What per cent of ¾ is 2 ? of 2 is ¾ ?

10. Tell how to write 1492, 1789, 1913 as Roman numbers.

Written.

INTEREST TABLE

NOTE. The interest of any sum of money may easily be found from the following table which gives the interest of $1 for various rates and years and months.

YR.	5%	6%	7%	8%	YR.	5%	6%	7%	8%
1	.05	.06	.07	.08	4	.20	.24	.28	.32
2	.10	.12	.14	.16	5	.25	.30	.35	.40
3	.15	.18	.21	.24	6	.30	.36	.42	.48
Mo.					Mo.				
1	.00416	.005	.00583	.00666	7	.02916	.035	.04083	.04666
2	.00833	.01	.01166	.01333	8	.03333	.04	.04666	.05333
3	.01250	.015	.01750	.02000	9	.03750	.045	.05250	.06000
4	.01666	.02	.02333	.02666	10	.04166	.05	.05833	.06666
5	.02083	.025	.02916	.03333	11	.04583	.055	.06416	.07333
6	.02500	.03	.03500	.04000					

1. From the table find the interest of $750 for 5 yr. 9 mo. at 8 %.*

2. What is the interest of $3600 for 7 yr. 1 mo. at 5 % ?

3. What is the amount of $3800 for 3 yr. 4 mo. at 7 % ?

4. Find the amount at 5 % of $3600 for 6 yr. 4 mo.

5. In 1900 the population of Oklahoma was 790391, and in 1910 it was 1657155. What was the per cent of increase ?

-----

* SUGGESTION : $.40 = Int. of $1 for 5 yr. at 8 %.
$.06 = Int. of $1 for 9 mo. at 8 %.
$.46 = Int. of $1 for 5 yr. 9 mo.   750 × $.46 = ?

6. A note at 5% for $3570 was dated June 1, 1910, and was paid March 1, 1913. What was the amount due?

7. What is the interest at 5% on a note for $5000 from Jan. 12, 1907, to Dec. 12, 1913?

8. A man sold 80 bbl. of apples at a profit of 15% and gained $25.50. How much did they cost him per barrel?

9. To each pupil in a class of 50 boys 25 words were given for spelling. The class missed 125 words. What per cent was received by the class?

10. I own ¾ of the stock of a ship and sell 15% of my share for $2700. What is the value of the ship?

LXXIV

Oral.

Rapidly supply the missing term :

Minuend	74	46		43	53		61	
Subtrahend	39		36	26		34	29	64
Difference		24	15		11	42		19

1. What will be the cost of 3 pk. of cherries at 2¢ a pint?

2. At the rate of 3 oranges for 10¢, how much will 4 dozen cost?

3. Divide ⅔ by ⅚; .024 by 600.

4. What is the cost of 72 articles at 33⅓¢ each? at 12½¢ each? at 16⅔¢ each? at 25¢ each? at 37½¢ each?

5. Tell how to write 1789, 1913, 1776 as Roman numbers.

Rapidly supply the missing term:

Minuend	82		81	94	60			75	51
Subtrahend	34	56			47		39	19	
Difference		17	25			32	33		39

6. If a milk can holds 25 qt. 1 pt. how many half pints will it hold?

7. How much molding will it take to go around a room 30 ft. long and 25 ft. wide?

8. If I pay $4½ for 6 lb. of tea, how much must I pay for 15 lb.?

9. I bought 2 gross of pencils for $2.60 and sold them for 2¢ apiece. How much did I gain?

10. When wood is $8¾ a cord, how much must I pay for ⅕ of a cord?

Written.

1. If cloth costs a tailor $4.50 a yard, at what price must he mark it so that after deducting 10 % from the marked price he will still make 15 % ?

2. What per cent of 10 bu. is 6 qt.?

3. Write the following cash account. Receipts: Oct. 1, 1912, cash on hand, $135; Feb. 6, wages, $75.50; Feb. 9, debt of J. Jones paid, $87.90; Feb. 15, received from T. Ray on account $42.25. Amounts paid out: Feb. 6, rent, $75; Feb. 10, interest, $60; Feb. 12, coal, $8.75; Feb. 15, gas, $3.75. Balanced on Feb. 20.

4. A farmer set out 3000 celery plants to the acre, but only 75 % of them matured. He put four heads in a bunch and sold them for 10¢ a bunch. If his expenses were $100 an acre, how much did he make on 5 A.?

5. A man's income is $2500 a year. Of this he spends 30% for board, 12½% for clothes and books, and 10% for incidentals. How much does he save in a year?

6. A broker buys 1750 bags of coffee for a customer at 15¢ per pound. There being 130 lb. to the bag and the broker charging $10 per 250 bags, how many pounds are bought, and what is the total cost, including commission?

7. An agent charged $6.63 for selling 52 bu. of tomatoes at 85¢ a bushel. What was the rate of his commission?

8. The gross proceeds of a sale were $105, and the net proceeds were $102.90. What was the rate of commission?

9. My income last year was $1800 and my expenses were $1356. What per cent of my income did I spend?

10. The product of three numbers is 500. Two of the numbers are 3½ and 15. What is the third number?

LXXV

Oral.

Multiply each of the following numbers first by 3, then by 6, then by 9:

15, 24, 20, 80, 40, 38, 57, 69, 75, 29, 66, 14, 56, 42, 60, 45, 13, 30, 17, 50, 47, 58, 84, 95, 64, 86, 48, 72, 85, 34.

1. What is the interest of $700 for 3 yr. at 4%?

2. To how much will $1200 amount at 5% in 2 yr.?

3. How much will 6 bu. 3 pk. of corn cost at 80¢ a bushel?

4. If .25 of a ton costs $5, how much will 1.5 tons cost?

5. Divide 8 by 2000.

Multiply each of the following numbers first by 2, then by 4, then by 8:
57, 22, 69, 24, 75, 47, 85, 25, 26, 96, 37, 32, 79, 34, 48, 42, 89, 44, 29, 78, 40, 47, 49, 36, 75, 90, 35, 38, 46, 77, ·

6. A watch was sold for $120, at a gain of 20 %. What was the cost?

7. A man having $250, spent $80. What per cent of his money had he left?

8. If by selling land at $150 an acre I lose 25 %, for how much must I sell it to gain 40 % ?

9. If 6 % of my income is $300, and my income is 10 % of my capital, what is my capital?

10. Divide 4.8 by 600.

Written.

1. Find the interest of $2450 at 4 % for $2\frac{3}{4}$ years.

2. What is the amount of $1250 at 5 % for 2 yr. 3 mo.?

3. October 19, 1912, Mr. James Johnson bought of Anderson & Co., dry goods merchants, the following articles : 12 yd. cotton cloth @ 7¢ ; $5\frac{1}{2}$ yd. silk @ $1.20 ; $8\frac{3}{4}$ yd. ribbon @ 12¢ ; $3\frac{1}{2}$ yd. velvet @ $2.50. Make out the bill, receipt it, and write a check for the amount after deducting 5 % for cash payment.

4. Make out your own cash account, inserting dates and items. Receipts: $1.50, $.27, $6.35, $7.22. Amounts paid out: $.35, $.05, $.73, $.48, $1.95.

5. An attorney collects a claim of $650.50. He pays $23.75 costs and charges 5 % for collecting. How much does he pay the owner?

---

6. If 16½ yd. of cloth cost $3.90, how many yards will $10½ buy?

7. A man bought a house for $1900, which was 25 % of what he paid for a farm. How much did he pay for both?

8. Reduce 27 sq. yd. 5 sq. ft. 58 sq. in. to square inches.

9. A merchant having $8570 to invest bought an interest in a foundry for which he paid $4000. He invested 40 % of the remainder in grain, and with what was left he bought a lot. How much did he pay for the lot?

10. Add 85.7, 67.15, 56.045, 7.8. Subtract 123.975 from the sum. Multiply the difference by 92.8. Divide the product by .04.

LXXVI

Oral.

Divide each of the following numbers first by 3, then by 6, then by 9 :

39, 48, 42, 60, 45, 63, 72, 81, 75, 57, 84, 18, 27, 51, 54.

$8 + 7 - 10 = ?$ $13 - 6 + 9 = ?$ $14 - 10 + 13 = ?$ $17 + 13 - 11 = ?$

What is percentage? Name and define the terms used in percentage.

What is interest? Name and define the terms used in interest.

Given the base and the rate tell how to find the percentage ; the amount.

Given the principal, the rate, and the time, tell how to find the interest ; the amount.

1. I started in business with $2000 and gained 5 % the first year. How much did I gain? How much was I worth at the end of the year?

2. I lent $2000 for 3 years at 5 %. How much interest should I get? How much does the loan amount to at the end of the three years?

What is added in the second example? What, then, is the added element in an interest example?

How does an example in which we have to find the interest differ from an example in which we have to find the percentage?

3. A saddle that cost $25 was sold at a loss of 10 %. What was the loss? the selling price?

Name and define the terms used in profit and loss. Compare them with the terms used in percentage. Compare them with the terms used in interest.

4. Find the commission at 2 % for collecting a debt of $3500.

Name and define the terms used in commission. Compare them with the terms used in percentage, profit and loss, and interest.

What is the element in interest that you do not find in percentage, profit and loss, or commission?

5. An agent collects a debt of $500 at a commission of 3 %. How much does he send to his employer? What name do you give to the amount he sends his employer?

———

Divide each of the following numbers first by 4, then by 6, then by 8:

52, 60, 72, 56, 64, 76, 68, 84, 92, 88, 96, 90, 78, 120, 144.

$$15 + 10, - 13 = ? \qquad 9 + 14, - 10 = ?$$
$$15 - 8, + 7 = ? \qquad 33 - 21, + 10 = ?$$

6. A farmer raised 350 bbl. of apples and sold 20 % of them. How many barrels had he left?

7. I bought a piano for $400 and sold it at a loss of 20 %. What was the selling price?

8. An agent sells a farm for $3000 on a commission of 2 %. If he deducts his commission, how much does he send the owner?

9. What is the interest of $420 for 2 yr. at 6 %?

10. To how much will $100 amount at 5 % in 2½ yr.?

Written.

(Value of Crops)

1. Corn, $1850776000   (*a*) Give the total
    Hay,   854615000   value of the crops.
    Wheat,   603639000   (*b*) Give the per cent
    Oats,   476169000   of the value of the corn
    Potatoes,   188501000   as compared with the
    Barley,   120845000   hay; as compared with
    Flaxseed,   39693000   the hay and the wheat.
    Rye,   24370000
    Buckwheat,   12526000

(*c*) Find the per cent of the value of the corn as compared with the oats, potatoes, barley, flaxseed, rye, and buckwheat together.

2. If the production of corn equaled 3169137000 bu. and the yield was 29.3 bu. to an acre, about how many acres were under cultivation?

3. Multiply 68087 by 3028.

4. Divide 32460574 by 735.

5. Mr. Johnson has a farm of five fields containing, respectively, $18\frac{3}{4}$ A., $20\frac{4}{5}$ A., $21\frac{7}{10}$ A., $22\frac{5}{16}$ A., and $24\frac{9}{32}$ A. How large is his farm?

6. Find the product of $\frac{3}{7} \times \frac{14}{15} \times \frac{20}{24}$.

7. When hay is worth $\$15\frac{1}{2}$ per ton, how much is $\frac{7}{8}$ of a ton worth?

8. Find the value of $6 \div 5\frac{2}{3}$; of $27\frac{3}{4} \div 5$; of $781\frac{5}{6} \div 43\frac{3}{4}$.

9. A farmer sold $\frac{3}{4}$ of a bushel of seed corn for $\$\frac{3}{4}$. How much, at this rate, would he get for $\$27\frac{3}{4}$?

10. Find the value of $\dfrac{\frac{3}{4} - \frac{2}{3}}{\frac{2}{5} + \frac{5}{6}}$.

LXXVII

Oral.

Rapidly divide the following numbers first by 10, then by 20, then by 40:

1.2, 8.6, 5.64, .828, 84.76, 47.836, .24, .024, 2.4, .0048

$$97 + 28 + 43 - 90 - 27 = ?$$
$$39 + 49 - 16 + 31 - 11 = ?$$
$$52 - 27 + 25 - 20 + 47 = ?$$

1. Mr. Smith sold a horse to Mr. James, gaining 20 %, and Mr. James sold it to Mr. Brown for $150, gaining 25 %. How much did the horse cost Mr. Smith?

2. I buy oranges at the rate of 15 ¢ a dozen, and sell them at the rate of 3 for 10 ¢. What is my gain per cent?

3. An agent collected $2940. How much did he remit to his employer after deducting his commission of 2 %?

4. A man marks his goods 30% above cost. If he deducts 10 % from his marked price, what per cent does he gain?

5. One man can dig a ditch in 5 da. and another in 6 da. In what time will they dig it working together?

Rapidly divide the following numbers first by 100, then by 200, then by 300:

2.4, .024, .48, .048, 4.8, 48, 7.2, 72, 720, .072, .72

$3 \times (8 - 6) = ?$ $3 \times 8 - 6 = ?$

$(5 + 4) \times (3 + 5) = ?$ $5 + (4 \times 3) + 5 = ?$

6. I owned $\frac{3}{4}$ of a business and sold $\frac{2}{3}$ of my share for $10000. What was the value of the business?

7. A consignment of goods was sold for $160 less than cost, and the loss was 20 %. To gain $12\frac{1}{2}$ %, for how much should it have been sold?

8. How must an article that cost $16 be marked so that after lowering the marked price 20 %, it may be sold at a profit of 25 %?

9. I sold my bicycle for $90 and gained $33\frac{1}{3}$ %. At a gain of 40 %, how much should I have received for it?

10. If 4 men can do a piece of work in 9 da., how many men, at the same rate, can do it in 4 da.?

Written.

1. During 8 hours a freight train made the following mileages: 32.15, 28.375, 15.687, 20.2, 15.63, 17.5, 8.95 and 21.3 mi. How far did the train run during the 8 hours?

2. Reduce $\frac{17}{320}$ to a decimal; $.016\frac{2}{3}$ to a common fraction.

3. From $42\frac{5}{9}$ take $.93\frac{5}{16}$.

4. Multiply 127.05 by 1.8.

5. Divide 101.6688 by 43.08.

---

6. $\dfrac{\frac{2}{9}}{\frac{3}{4}} \times \dfrac{.75}{\frac{5}{9}} = ?$

7. What is the cost of the following: 32 chests of tea at $41.25 each; 24 bags of coffee, 75 lb. each, at 28¢ a pound; 58 casks of rice at $29 each; and 84 bbl. of oil, 45 gal. each, at $2.05 per gallon?

8. Write in bill form and receipt: J. Marsh, bought of Brown & Smith, April 2, 1912, 50 lb. soap @ $10\frac{1}{2}$¢; April 5, 12 bbl. flour @ $7\frac{1}{2}$; April 7, 30 lb. soap @ 12¢; April 8, 120 lb. butter @ 30¢; April 11, 6 bbl. flour @ $8; April 14, 87 lb. sugar @ $.07.

9. Mr. Townsend sold his house and farm of $85\frac{3}{4}$ A. for $8132. Allowing $2750 for the house, how much did he receive per acre for the farm?

10. How much must be paid for 6 bales of cotton containing 420 lb. each, at the rate of $16\frac{3}{4}$¢ a pound?

LXXVIII

Oral.

Rapidly find:

$\frac{5}{6}$ of 24; 72; 64; 144; 132; 18; 30; 60; 12; 36; 42.

$.12\frac{1}{2}$ of 24; 72; 64; 144; 40; 80; 16; 32; 48; 56; 96; 104; 112; 120.

$8\frac{1}{3}\%$ of 24; 72; 144; 36; 48; 96; 12; 60; 120; 132; 84.

1. A newsboy buys papers at $\frac{1}{2}\phi$ each and sells them at a cent apiece. How much does he make on 100 papers?

2. If I sell $1\frac{3}{4}$ A. from my lot 20 rd. long and 16 rd. wide, what per cent of it have I left?

3. A merchant bought paper at $1.60 a ream, and sold it at 10ϕ a quire. What per cent did he gain or lose?

4. I sold a house for $240 less than it cost, thereby losing $12\frac{1}{2}\%$. How much did it cost?

5. I sold a horse for $480 and gained 20%. How much did it cost?

Rapidly find:

$\frac{5}{8}$ of 56; 32; 48; 24; 72; 144; 120; 40; 80; 96.

.$66\frac{2}{3}$ of 15; 75; 18; 12; 24; 48; 36; 27; 21; 42.

$6\frac{1}{4}\%$ of 64; 32; 48; 80; 96; 112; 160; 128; 192.

6. Four pints is what per cent of a bushel?

7. If you pay 40ϕ for a gross of pens and sell them at 1ϕ apiece, how much do you gain?

8. If 25 lb. of flour cost $1.25, how much will 3 cwt. cost?

9. At what price must $\frac{1}{2}$ doz. chairs, worth $15 a dozen, be sold in order to gain 50ϕ apiece?

10. If 37 sheep produce 1 cwt. of wool, how much do 185 sheep produce?

Written.

1. What is the cost of 897 apples at $2.75 per C.?

2. At $8.25 per C., how much will 3816 lb. of wheat flour cost?

3. A peddler sold 2915 lb. of rags at $20 a ton. How much did he receive?

4. How many times will a wheel 8 ft. 3 in. in circumference revolve in going 45 mi.?

5. A boy was born May 4, 1897. His sister is 3 yr. 9 mo. 24 da. older. When was she born?

---

6. What is the cost of 48000 bricks at $8 per M.?

7. Find the cost, at $16.50 a ton, of 5 bales of hay averaging 225 lb. each.

8. Find the cost of 4 sticks of timber, each 8 in. by 10 in. and 30 ft. long, at $15 a thousand ft., board measure. (A board foot is 1 ft. long, 1 ft. wide, and 1 in. thick.)

9. A field is 42 rd. long and 35 rd. wide. Find its value at $37.50 an acre.

10. Find the cost, at $50 an acre, of a rectangular field 1650 ft. long and 825 ft. wide.

LXXIX

Oral.

Rapidly find the percentage:

Base	Rate	Base	Rate	Base	Rate
48 oz.	$87\frac{1}{2}\%$	$12	$66\frac{2}{3}\%$	1250 lb.	1%
24 yd.	$12\frac{1}{2}\%$	$24	$62\frac{1}{2}\%$	1000 pt.	$\frac{1}{2}\%$
20 ft.	150%	$50	4%	1000 bu.	75%
64 in.	$6\frac{1}{4}\%$	$40	75%	8000 qt.	$1\frac{1}{4}\%$
12 lb.	$16\frac{2}{3}\%$	$60	$\frac{1}{4}\%$	1200 pk.	$16\frac{2}{3}\%$

1. I sold a horse for $480 and gained 20%. How much did it cost?

2. By selling a pound of butter for 25 ¢, a dealer lost 16⅔%. For how much a pound must he sell it to gain 20%?

3. A boy sold his top for 3 ¢ and lost 2 ¢. What per cent did he lose?

4. When silk was sold for $2 a yard there was a gain of 33⅓%. What was the cost?

5. Three fourths of 36 is ½ of what number?

Rapidly find the percentage:

Base	Rate	Base	Rate	Base	Rate
$2	½%	$600	5½%	$1000	75%
1 A.	125%	$120	75%	$1200	16⅔%
$¾	200%	$320	8%	$6000	33⅓%
3 bu.	25%	$160	31¼%	$1000	2½%
$½	300%	$100	¾%	$1600	1¼%

6. A watchmaker sold a watch for $24 and gained 20% on the cost. How much did he gain?

7. A cow that cost $20 was sold at auction for $18. What was the loss per cent?

8. If a dealer buys a horse for $90 for how much must he sell it to gain 20%?

9. A man having a farm of 200 acres sold 80 acres. What per cent of the farm remained unsold?

10. If it takes 5½ yd. of silk 20 in. wide to line a cloak, how many yards 40 in. wide will it take?

Written.

1. An agent receives $84 commission for buying goods at the rate of 1⅛%. What is the cost of the goods?

2. A man collects a bill amounting to $11268 and charges 3¼% commission. Find his commission and the net proceeds.

3. A dealer bought 1000 bu. of potatoes at a certain price per bushel. One hundred bushels were damaged before he could sell them, but he sold the remainder for $55, and found he had gained 10% on the cost of his entire purchase. How much did he pay per bushel?

4. A grocer sold tea at 112½% of the cost and gained 25 ¢ on a pound. How much did it cost?

5. A telephone wire whose length is 1 mi. 30 rd. costs $10.50. What is the price of the wire per foot?

---

6. How much will 8 planks 12 ft. long 14 in. wide and 3 in. thick cost at $15 per M.?

7. Peaches were bought at 80 ¢ a basket and sold at a loss of 12½%. If the loss was $7.20, how many baskets were sold?

8. A dealer sold coal at $6.30 a ton and gained 12½%. What per cent would he have gained had he sold the coal at $8 a ton?

9. I bought goods for $500. I sold ½ of them at a loss of 20% and ½ at a gain of 30%. What was my entire gain or loss?

10. What is the quotient of 2.25 divided by 1.5? by 150? by .009?

LXXX

Oral.

Rapidly find the gain or loss and the selling price :

Cost	Rate of Gain	Rate of Loss	Cost	Rate of Gain	Rate of Loss
$40	10 %	——	$100	——	20 %
$60	——	20 %	$120	12½ %	——
$35	——	60 %	$150	33⅓ %	——

1. By selling goods for $75 I lose $15. What per cent do I lose?

2. A grocer sold 2 bbl. of sugar for $24 each. On one he gained 20 % and on the other he lost 20 %. How much did he gain or lose on the two ?

3. Find the interest and the amount of $600 at 6 % for 1 yr. 3 mo.

4. Find the per cent of gain on a dozen oranges bought for 18¢ a dozen and sold for 2¢ apiece.

5. How many yards are there in ¾ of a mile?

Rapidly find the gain or loss and the selling price :

Cost	Rate of Gain	Cost	Rate of Loss
$450	33⅓ %	$560	14⅐ %
$480	12½ %	$570	66⅔ %
$500	20 %	$580	25 %
$520	50 %	$600	16⅔ %
$540	11⅑ %	$630	33⅓ %

6. A lawyer collected a debt of $600 for me, charging 2½ % for collecting. What was his fee ?

7. Property that was worth $10000 six years ago has increased in value 250 %. What is its present value?

8. By selling a cow for $20 less than cost a farmer lost 20 %. What was the selling price?

9. How many rods are there in $\frac{3}{8}$ of a mile?

10. The area of a square field is 64 sq. rd. How many yards long is a fence that incloses the field?

Written.

1. Find the interest and the amount of $6040 at 4 % for 1 yr. 8 mo.

2. How shall I mark damaged goods that cost $1.20 a yard, so that I may deduct 25 % from the marked price and lose only 5 %?

3. A merchant by selling goods for $364 loses 9 %. For how much should they be sold to gain 8 %?

4. What is a real estate agent's fee, at 8 %, for selling a house for $14680, and a lot for $7620?

5. Add $\frac{3}{4}$ of $\frac{5}{8}$ of $\frac{3}{10}$, $\frac{1}{5} + \frac{7}{10}$, and $\frac{3}{8}$.

6. A collector received $123.75 for collecting bills, at 5 % commission. How much money did he collect?

7. A dealer sold 2 organs at $125 each. On one he gained 25 % and on the other he lost 25 %. How much did he gain or lose on both?

8. How much did I receive for 23 doz. eggs that were bought at the rate of 2 for 5 ¢ and sold at a gain of 25 %?

9. How much will a farm 75 rd. by 40 rd. cost at $25 an acre?

10. $\dfrac{3\frac{1}{4} - 2\frac{1}{2}}{1\frac{1}{2} \times \frac{1}{3}} \div \frac{9}{11} = ?$

FIFTH MONTH

GENERAL REVIEW

LXXXI

Oral.

Rapidly find the commission:

Amount of Sale	Rate	Amount of Sale	Rate	Amount of Sale	Rate
$1000	1 %	$4500	2 %	$7000	$\frac{4}{5}$ %
$2000	3 %	$5000	$1\frac{1}{2}$ %	$7200	$\frac{3}{8}$ %
$3000	2 %	$6000	$1\frac{1}{4}$ %	$7500	$1\frac{1}{2}$ %
$4000	$1\frac{1}{2}$ %	$6300	4 %	$8000	$\frac{7}{8}$ %

Beginning with 100 count backwards by 9; by 8; by 7.

1. Mrs. Burt canned during the summer 10 qt. of peaches, 8 qt. of cherries, 25 qt. of strawberries, 15 qt. of blackberries, and 28 qt. of raspberries. How many quarts of fruit had she for use during the winter?

2. Robert gave $\$\frac{1}{4}$ for a circus ticket, $\$\frac{4}{5}$ for a straw hat, and had $\$\frac{1}{10}$ remaining. How much had he at first?

3. Change to decimals and add $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{1}{8}$.

4. A grocer sold 5 pk. 3 qt. of peaches to a customer at 15¢ a quart. How much did he receive for them?

5. Reduce $\frac{2}{5}$ of a bushel to lower denominations.

197

Rapidly find the commission:

Amount of Sale	Rate	Amount of Sale	Rate	Amount of Sale	Rate
$9000	2%	$18000	2%	$25000	$\frac{2}{5}\%$
$10000	$\frac{1}{2}\%$	$20000	3%	$26000	$1\frac{1}{2}\%$
$10500	$\frac{1}{3}\%$	$21000	4%	$27000	$\frac{2}{3}\%$
$12000	$\frac{1}{4}\%$	$22000	5%	$28000	$\frac{3}{4}\%$

Beginning with 100 count backwards by 6; by 5; by 4.

6. A boy has 14¢ in his pocket, 23¢ in his hand, and 40¢ in his bank. How much has he all together?

7. How many pounds of candy are there in two packages, one containing $6\frac{1}{2}$ lb. and the other $5\frac{3}{4}$ lb.?

8. From $8\frac{1}{4}$ take .65.

9. Reduce to mixed numbers, $\frac{82}{3}$, $\frac{59}{9}$, and $\frac{204}{12}$.

10. Reduce $2\frac{5}{6}$ to sixths, $7\frac{5}{8}$ to eighths.

Written.

1. Add: 53456
64372
93534
35472
74539
45684
94865
68497
81372
98536
79476

2. The grain produced in the United States one year was as follows: Indian corn, 2772376000 bu.; wheat, 737189000 bu.; oats, 1007353000 bu.; barley, 170284000 bu.; rye, 32239000 bu.; and buckwheat, 17438000 bu. Find the total number of bushels of grain produced. How many more bushels of Indian corn than of wheat were produced?

3. A drygoods merchant sold a lady $18\frac{3}{4}$ yd. of flannel, $21\frac{7}{8}$ yd. of silk, and as many yards of calico as of both the other goods. How many yards in all did he sell?

4. Add ten thousand and one millionth, four hundred-thousandths, ninety-six hundredths, forty-seven thousand and sixty ten-thousandths, thirty-seven hundred-thousandths

5. Find the value of $48\frac{15}{100} + \$.97 + \$\frac{4}{5} + \$.62\frac{1}{2} + \$\frac{5}{8}$.

---

6. Add: 46753
89925
92764
73681
76812
54513
95132
49157
71579
85793
77934
43696

7. A merchant sold $27\frac{5}{8}$ yd. of cloth to one person, $21\frac{3}{4}$ yd. to another, $19\frac{3}{8}$ yd. to another, and had $16\frac{1}{2}$ yd. left. How many yards had he at first?

8. $.4 + 2.02 + 1.004 + 20.016 + 5.00012 + 7.0015 = ?$

9. Reduce 7 mi. 50 yd. 2 ft. 10 in. to inches.

10. Reduce 3 yd. 2 ft. 4 in. to yards and the decimal of a yard.

LXXXII

Oral.

Rapidly find the interest:

Principal	Time	Rate	Principal	Time		Rate
$100	1 yr.	6%	$100	1 yr.	6 mo.	6%
$200	2 yr.	6%	$200	2 yr.	4 mo.	6%
$300	2 yr.	5%	$300	1 yr.	8 mo.	6%
$400	3 yr.	6%	$400	2 yr.	9 mo.	6%
$500	3 yr.	7%	$500	1 yr.	10 mo.	6%

Define percentage. What is the added element in interest?

1. A man had $145 in the bank and drew out $89. How much had he left in the bank?

2. The sum of three numbers is 140. One of them is 24 and another is 48. Find the third number.

3. A farmer had 3.15 A. and sold 2.20 A. How many acres had he left?

4. From a barrel containing 10 gal. of molasses a grocer sold 6 gal. 3 qt. How many gallons and quarts remained?

5. Reduce $\frac{1}{250}$ to a decimal fraction.

———

Rapidly find the interest:

Principal	Time	Rate	Principal	Time		Rate
$1000	1 yr.	5%	$1000	1 yr.	6 mo.	6%
$2000	2 yr.	6%	$2000	2 yr.	8 mo.	6%
$3000	3 yr.	4%	$3000	3 yr.	4 mo.	6%
$4000	2 yr.	8%	$4000	2 yr.	8 mo.	6%
$5000	3 yr.	7%	$5000	1 yr.	9 mo.	6%

6. From $5\frac{1}{2}$ take $2\frac{3}{4}$. From $\frac{3}{4}$ take $\frac{2}{3}$.

7. How much will 600 eggs cost at $37\frac{1}{2}$¢ a dozen?

8. $\frac{5}{8} \times \frac{4}{5} = ?$ $2\frac{1}{2} \times 3\frac{1}{5} = ?$ $.09 \times .6 = ?$ $.036 \times 100 = ?$

9. Find the length of the perimeters of 50 envelopes each $6\frac{1}{2}$ in. long and $3\frac{3}{4}$ in. wide.

10. A street vender bought $2\frac{1}{2}$ bu. of chestnuts and sold $\frac{2}{5}$ of them at once. How many bushels did he sell?

Written

1. A grocer's profits last year were: on fruits $350, on sugars $227, on potatoes $420, on sirups $165, on fish $137, on general merchandise $3785. He paid for rent $300, for insurance $125, for salaries $775, and for incidental expenses $195. What was his net profit?

2. The rye crop of principal countries in 1909 was: United States, 32239000 bu., Germany, 446767000 bu., Austria-Hungary, 162052000 bu., Russia in Europe, 877168000 bu., France. 56643000 bu., Spain, 34901000 bu., and the world, 1736683000 bu. How many bushels were produced by all other countries not mentioned? What approximate per cent of the total was that of the United States?

3. Multiply 72430 by 600. Divide 93673 by 900.

4. A man having $95\frac{1}{4}$ gal. of oil sold $13\frac{5}{8}$ gal. How many gallons had he left?

5. A note dated Aug. 10, 1912, was paid Nov. 11, 1913. How long did it run unpaid?

———

6. Multiply $35\frac{5}{8}$ by 27; 84 by $6\frac{1}{4}$; $82\frac{2}{3}$ by $8\frac{1}{2}$.

7. Mr. Harrison bought $\frac{1}{2}$ of a piece of cloth containing $19\frac{1}{2}$ yd. at $4\frac{1}{4}$ per yd. How much did it cost him?

8. Divide (using cancellation):

$39 \times 18 \times 42 \times 37$ by $9 \times 13 \times 14 \times 3$;

$65 \times 40 \times 36 \times 27$ by $35 \times 13 \times 9 \times 18$.

9. Multiply thirty-one and forty-two thousandths by seven and six hundredths.

10. At $16.50 a ton, how much will 2560 lb. of hay cost?

LXXXIII

Oral.

Rapidly find the results:

75 + 80	84 − 36	84 × 8	360 ÷ 4
62 + 48	78 − 59	72 × 9	452 ÷ 6
56 + 34	63 − 48	56 × 7	358 ÷ 7
42 + 87	56 − 37	83 × 5	424 ÷ 6

1. How many books at $\$\frac{3}{4}$ apiece can be bought for $\$3\frac{3}{4}$?

2. How many times is $\frac{2}{3}$ contained in 2? in 1?

3. If it took 4 ten-yard rolls of ribbon for the diplomas of the graduating class, and 12 in. was used for each diploma, how many graduates were there?

4. A field containing 6.4 A. was cut up into lots each containing .4 of an acre. How many lots were there?

5. Divide 72 by .6; .56 by .8; .081 by .9; 1.2 by 60.

———

Rapidly find the results:

68 + 42	87 − 32	45 × 3	324 ÷ 8
56 + 48	42 − 24	56 × 2	455 ÷ 5
98 + 33	64 − 38	87 × 4	874 ÷ 9
72 + 45	57 − 49	58 × 5	525 ÷ 7

6. At $\$2.25$ a yard how much will a merchant have to pay for 1000 yd. of velvet?

7. If $\frac{2}{3}$ of a cargo is worth $\$1200$, how much is the cargo worth?

8. At the rate of $\frac{3}{4}\cancel{c}$ each, how much will 2400 pencils cost?

9. If 4 qt. of berries cost 50¢ how much will 16 qt. cost?

10. Divide 6 by $\frac{2}{3}$; $\frac{7}{8}$ by $\frac{3}{4}$; .24 by 400; .048 by .06.

Written.

1. The state of Texas has an area of 265896 sq. mi. and Rhode Island has an area of 1248 sq. mi. How many states of the size of Rhode Island could be formed out of Texas and how many square miles would there be in excess?

2. Divide $34\frac{3}{8}$ by 8; 235 by $7\frac{5}{8}$; $317\frac{3}{8}$ by $29\frac{1}{2}$.

3. Mr. Hogan earns $\$2\frac{3}{4}$ a day, and his expenses are $\$7\frac{1}{4}$ a week. How many weeks must he work to pay for a lot worth $\$138\frac{3}{4}$?

4. Divide .01612 by 1.24; 745.36 by 200.

5. Mr. Delaney sold his farm containing 72.85 A. for $\$6607.49\frac{1}{2}$. For how much was it sold per acre?

———

6. Divide 736485 by 99. Prove the answer.

7. The stock of a railroad company is $\$3750000$. If it is divided into shares of $\$50$ each, how many shares are there?

8. Find the value of $\dfrac{\frac{3}{4} \text{ of } \frac{6}{7} \text{ of } \frac{8}{9}}{\frac{7}{8} \text{ of } \frac{9}{10} \text{ of } \frac{11}{14} \text{ of } \frac{15}{27}}$.

9. Find the value of $\dfrac{6.25 \div 3\frac{1}{4}}{3\frac{7}{8} - .275}$.

10. Multiply $31\frac{1}{4}$ by·25 ten-thousandths and divide the product by 625 ten-thousandths.

LXXXIV

Oral.

Rapidly answer:

18 is what part of 32? of 36? of 84? of 72? of 144? of 56? of 54?

12 is how many 100ths of 60? of 36? of 72? of 84? of 96? of 144? of 16?

24 is what per cent of 32? of 30? of 120? of 48? of 72? of 36? of 60? of 64?

$36 + 12, \div 6, - 2, \times 5, + 6, \div 6, + 24, - 8 = ?$

1. If 18 pigs cost $30, how much must be paid for 9 pigs?

2. A farmer raised 360 bu. of wheat on 12 A. of land. How much wheat at that rate could he raise on 15 A.?

3. If I buy chickens at the rate of 4 for $3 and sell them at the rate of 8 for $7, how much do I gain on 40 chickens?

4. How much will 24 lamp chimneys cost at the rate of $1.37½ a dozen?

5. Reduce 5 qt. to the decimal of a peck.

———

Rapidly answer:

16 is what part of 32? of 18? of 48? of 20? of 24? of 64? of 80? of 112?

15 is how many 100ths of 90? of 60? of 20? of 25? of 75? of 24? of 30?

20 is what per cent of 50? of 60? of 25? of 80? of 32? of 24? of 100? of 120?

6. Five pints is what per cent of a gallon?

7. What part of a bushel is 2 qt., 1 pt. ?

8. A house was bought for $6000 and sold for $\frac{1}{4}$ above cost. For how much was it sold ?

9. Simplify $\frac{\frac{2}{3}}{\frac{4}{5}}$.

10. A certain farm is valued at $8000, and Mr. Mack owns $\frac{4}{5}$ of it. What is the value of his share of the farm ?

Written.

1. Reduce 8 bu. 3 pk. 7 qt. 1 pt. to bushels and decimal of a bushel.

2. What per cent of 4 gal. 3 qt. 1 pt. is 5 qt. 1 pt. ?

3. How many seconds are there in 40 hr. 28 min. 21 sec. ?

4. Reduce 1220 min. to units of a higher denomination.

5. At $3.20 a bushel, how much will 8 bu. 2 pk. 6 qt. of peaches cost ?

6. What decimal part of a bushel is 1 pk. 2 qt. 1 pt. ?

7. Reduce 1 A. 120 sq. rd. 20 sq. yd. to square feet.

8. What is the exact number of days from Jan. 15, 1911, to Jan. 3, 1912 ?

9. Find your age to-day in years, months, and days.

10. Change .375 of a mile to lower denominations.

LXXXV

Oral.

Rapidly find the rate per cent:

Base	Percentage	Base	Percentage	Base	Percentage
1 bu.	8 qt.	$12	15 ¢	2 mi.	160 rd.
$120	$24	80 rd.	12 rd.	3 pk.	2 qt.
$945	$300	10 qt.	1 pt.	5 lb.	2 lb.
$450	$90	2 yd.	10 in.	$600	$500

1. A grocer sold 10 lb. of coffee from a bag containing 50 lb. What per cent remained?

2. If 1 yd. of silk costs $2½, how many yards can be bought for $17½?

3. How many square feet are there in a floor 25 ft. long and 20 ft. wide?

4. How many square rods are there in a field 40 rd. long and 18 rd. wide?

5. What is the width of a field 80 rd. long which contains 10 A.?

Rapidly find the rate per cent:

Base	Percentage	Base	Percentage	Base	Percentage
$960	$240	72 bu.	56 bu.	56 lb.	42 lb.
120 ft.	90 ft.	$40	$24	800	600
48 gal.	16 gal.	$60	$50	40	16
150 rd.	50 rd.	50	20	$84	$7

6. If a miller takes 3⅕ qt. of every bushel he grinds for toll, what per cent does he take for toll?

7. A farmer raised 1600 bu. of wheat and sold 480 bu. What per cent did he sell?

8. What is the area of a rectangular plot of ground having a base of 30 rd. and an altitude of 20 rd. ?

9. A certain garden is 150 ft. long and 150 ft. wide. How many square feet does it contain ?

10. How many feet of fence will it take to inclose the garden mentioned in example 9 ?

Written.

1. How many acres are there in a rectangular field whose base is 60 rd. and altitude 48 rd. ?

2. How much would a rectangular field like that in example 1 cost at $75 an acre ?

3. At 20¢ a square foot what would be the cost of fencing the same rectangular field with a fence 5 ft. high ?

4. In a box containing 1 gross 3 doz. and 8 pens, there are how many pens ?

5. $\dfrac{3\frac{1}{5} + 2\frac{2}{3}}{\frac{1}{2} \times \frac{4}{9} - \frac{1}{5}} = ?$

6. What is the value of 86260 bricks at $7.50 per M.?

7. A field contains 12 A. and is 24 rd. wide. How long is it ?

8. I bought 10 A. of land at $200 an acre and sold it at 8¢ a square foot. How much did I gain ?

9. How many bricks (8 in. by 4 in.) will pave a sidewalk 25 ft. by 10 ft. ?

10. A pile of wood is 20 ft. long, 4 ft. wide, and 8 ft. high. Find the cost of the wood at $3.75 a cord.

LXXXVI

Oral.

Rapidly find the per cent:

Cost	Gain	Loss	Cost	Gain	Loss	Cost	Gain	Loss
$100	$20	$10	$200	$25	$20	$300	$10	$30
$120	$12	$6	$240	$20	$6	$320	$4	$20
$150	$5	$3	$270	$9	$3	$350	$70	$7
$180	$9	$6	$280	$14	$7	$360	$30	$40

1. The width of a room is 15 ft. and this is $\frac{5}{6}$ of the length. How many square feet are there in the floor?

2. The owner of land 200 ft. by 300 ft. divides it into lots 25 ft. by 100 ft. How many lots will the land make?

3. If I paid $6500 for my house and spent $400 for painting it, and $200 for papering the rooms, for how much must I sell it to make $1500?

4. A man who had $8000 gave away $\frac{5}{8}$ of it. How much had he left?

5. How much will it cost to place a molding around a room 18 ft. by 15 ft. at 60¢ a yard?

Rapidly find the per cent:

Cost	Gain	Loss	Cost	Gain	Loss	Cost	Gain	Loss
$500	$10	$5	$600	$50	$12	$700	$70	$10
$520	$39	$26	$630	$70	$90	$720	$60	$12
$540	$60	$90	$640	$40	$16	$750	$300	$15
$560	$80	$70	$660	$44	$33	$780	$260	$13

6. How many times can I fill a glass that holds $\frac{1}{2}$ pt. from a pitcher that holds 2 gal.?

7. I paid 18¢ for 1½ lb. of lard. How much was it per pound?

8. If 3 boys can cut a cord of wood in 8 hr., how long, at the same rate, will it take 4 boys to cut it?

9. If 3 qt. 1 pt. of oil costs 14¢, how much will 1 gal. 1 qt. cost?

10. If it takes 2½ yd. of cloth to make a pair of trousers, how many pairs can be made from 20 yd. of cloth?

Written.

1. John F. Horn, Chicago, Ill., bought for account of George Draper & Co., May 28, 1912, 250 bbl. pork @ $13.50, 200 bbl. beef @ $14.25. The cartage was $11.75, and commission 2¼ %. What was the gross cost?

2. The material for a dress costs $1.75 a yard, and 6 yd. are needed; also 6 yd. of lace at 60¢ a yard; 5 yd. of lining at 6¢ a yard; and 2 doz. buttons at 10¢ a dozen. My dressmaker will make it for $12, and will save me 10 % on the cost of materials by purchasing them for me. Which is the better, to let her purchase the materials and make it, or to buy a similar dress ready-made for $25? What is the difference in cost?

3. How many pints are there in 7 bu. 3 pk. 5 qt.?

4. Reduce $\frac{1}{32}$ of a day to minutes.

5. How many square yards are there in the ceiling of a room which is 21 ft. long and 18 ft. wide?

---

6. Add 3⅛, 4⅛, 5¾, and 6⅝.

7. Find the time from March 4, 1909, to Jan. 16, 1913.

8. A boy was 14 yr. 8 mo. 7 da. old. His brother was 2 yr. 6 mo. 5 da. younger. What was the younger brother's age?

9. A rectangular field containing 27 A. is 30 rd. wide. What is the length of the perimeter of the field?

10. What is the cost of a ham weighing 10 lb. 10 oz., at $12\frac{1}{2}$ ⊄ a pound.

LXXXVII

Oral.

Rapidly find the results:

$\frac{5}{6} + \frac{5}{18}$	$\frac{2}{3} - \frac{5}{18}$	$\frac{2}{9} \times \frac{7}{11}$	$\frac{5}{6} + \frac{5}{12}$
$\frac{7}{8} + \frac{7}{16}$	$\frac{3}{7} - \frac{3}{14}$	$\frac{3}{5} \times \frac{16}{15}$	$\frac{3}{4} \div \frac{5}{6}$
$\frac{3}{8} + \frac{11}{16}$	$\frac{5}{6} - \frac{7}{12}$	$\frac{3}{7} \times \frac{21}{24}$	$\frac{2}{3} + \frac{10}{12}$
$\frac{3}{5} + \frac{4}{25}$	$\frac{3}{5} - \frac{8}{25}$	$\frac{5}{3} \times \frac{14}{15}$	$\frac{4}{5} \div \frac{5}{4}$

1. Find the cost of $6\frac{1}{4}$ lb. of mutton at 24 ⊄ a pound.

2. When gas costs 80 ⊄ a thousand cubic feet, how much will 1250 cubic feet of gas cost?

3. How many feet of fence will be needed to inclose a field 30 rd. by 20 rd.?

4. A farm of 12 acres produced 10 bu. of wheat to an acre. The wheat sold for 5 ⊄ a pound (60 lb. to a bushel). How much did it bring?

5. How much will 4625 ft. of lumber cost at $16 a thousand feet?

Rapidly find the results:

$\frac{11}{14} + \frac{5}{7}$	$\frac{2}{5} - \frac{2}{15}$	$\frac{3}{4} \times \frac{7}{9}$	$\frac{3}{4} \div \frac{7}{8}$
$\frac{4}{15} + \frac{2}{3}$	$\frac{5}{6} - \frac{5}{12}$	$\frac{5}{6} \times \frac{12}{25}$	$\frac{3}{4} \div \frac{9}{8}$
$\frac{11}{12} + \frac{5}{6}$	$\frac{4}{7} - \frac{3}{14}$	$\frac{4}{9} \times \frac{9}{16}$	$\frac{3}{5} \div 2\frac{1}{2}$
$\frac{5}{16} + \frac{7}{8}$	$\frac{3}{4} - \frac{9}{16}$	$\frac{5}{7} \times \frac{21}{25}$	$\frac{4}{5} \div \frac{4}{5}$

6. If $2\frac{5}{8}$ yd. of ribbon cost $42¢$, how much will $3\frac{1}{2}$ yd. cost?

7. A mason earned $\$23$ more in $18\frac{1}{2}$ da. than he earned in $12\frac{3}{4}$ da. How much did he receive a day?

8. What per cent of 3 qt. is 1 gal.?

9. What per cent of 1 gal. is 3 qt.?

10. A stationer bought a ream of note paper for $\$2$ and sold it for $15¢$ a quire. How much was his profit?

Written.

1. How much will 1240 sheets of foolscap cost at $15¢$ a quire?

2. Reduce 4 min. 25 sec. to the decimal of a day.

3. A cannon ball traveled at the rate of 1500 ft. in $1\frac{1}{2}$ sec. How far had it gone in $\frac{11}{15}$ of a minute?

4. A pole stands $\frac{1}{7}$ in the mud, $\frac{2}{5}$ in the water, and 32 ft. in the air. How long is the pole? [Make a diagram showing the parts.]

5. Simplify $\dfrac{4\frac{2}{3} - (6\frac{2}{3} \times \frac{3}{5})}{2\frac{3}{4} + (8\frac{3}{4} \div 13\frac{1}{8})}$.

6. $.04 \times 750 = ?$ 900 is $\frac{2}{45}$ of what number? $\$2400$ is .03 of what number?

7. If a bin contains 5 bu. 3 pk. 2 qt. of wheat, how much is the wheat worth at $80¢$ a bushel?

8. At $\$65$ an acre, what is the value of a rectangular farm 160 rd. long and 150 rd. wide? For how much must I sell the farm to make 20 %?

9. A farmer raised 517 bu. 1 pk. 3 qt. of potatoes. He sold 20 % of them. How many bushels, pecks, and quarts did he sell?

10. Simplify $\dfrac{11\frac{3}{7} \div (8\frac{1}{3} \div 2\frac{1}{2})}{2 \times 1\frac{1}{2} \times 1\frac{1}{3}}$.

LXXXVIII

Oral.

Rapidly find the results:

.5 + .05	25 − .8	.7 × 10	.7 ÷ 10
.8 + .15	38 − .15	.8 × 100	.8 ÷ 100
.06 + .08	1.8 − .06	.05 × 100	.05 ÷ 100
.14 + .005	35 − .017	.016 × 100	.016 ÷ 100

1. How many cubic feet are there in a bin 4 ft. by 3 ft. by 9 ft.?

2. If a cellar 20 ft. by 18 ft. by 6 ft. is full of earth, how many cubic yards of earth does it contain?

3. What is $\frac{1}{4}$ % of $120?

4. A man bought a cow for $20. For how much must he sell it to gain 5 %?

5. An auctioneer sold a horse for $160 and charged 5 % commission for his services. How much did he receive?

Rapidly find the results:

.8 + .6	10 − .05	.8 × 100	1.2 ÷ 40
.07 + .1	1.5 − .08	.06 × .2	2.4 ÷ .4
.28 + .15	.25 − .17	.15 × .3	.48 ÷ .6
.17 + .015	.36 − .018	.018 × .02	.048 ÷ .06

6. At $80 an acre, how much will $\frac{7}{16}$ of an acre of land cost?

7. Which is the shorter distance, $\frac{3}{4}$ of a mile or $\frac{7}{8}$ of a mile? How many rods shorter is it?

8. I have a pile of wood measuring 4 ft. by 4 ft. by 4 ft. How much is it worth at $4 a cord?

9. A freight car, 30 ft. long, has on it a pile of pine wood covering the entire length of the car, and piled 8 ft. wide and 8 ft. high. How many cords are there in it?

10. A grocer bought 144 bu. of turnips. He sold 25 % of them. How many bushels had he left?

Written.

1. How much will a pile of wood 64 ft. long, 4 ft. wide, and 8 ft. high cost, at $4.75 a cord?

2. A farm was bought for $11360; the fencing cost $675, tilling the soil cost $745, building a house cost $2590, and barns cost $1310. The farm was sold at a profit of 20 % on the entire cost; 65 % of the selling price was paid in cash, and the balance by a note. What was the amount of the note?

3. Find the interest on the note given as part payment in the sale of the farm mentioned in example 2, at 5 % for 3 yr. 6 mo. Find the amount.

4. What is the interest of $3460 at $4\frac{1}{2}$ % for 9 mo.?

5. How many barrels of apples, at 1.87\frac{1}{2}$ a barrel, must be given in exchange for 12$\frac{1}{2}$ yd. of cloth at 60¢ a yard?

6. How many cords of wood are there in a pile 22.5 ft. long, 4 ft. wide, and 4.8 ft. high?

7. At $37\frac{1}{2}\cancel{c}$ a cubic yard how much will it cost to dig a cellar 36 ft. long, 24 ft. wide, and $5\frac{1}{4}$ ft. deep?

8. A commission merchant sent me $829 from the sale of 500 bbl. of apples at $1.75, after paying $20 freight and $8.50 storage. How much commission did he charge me?

9. Find the interest on $1350 at 5% for 8 mo.

10. What is the amount of $6040 at 4% for 1 yr. 8 mo.?

LXXXIX

Oral.

Rapidly reduce to improper fractions :

$3\frac{1}{4}$; $7\frac{2}{3}$; $8\frac{1}{2}$; $9\frac{1}{4}$; $6\frac{2}{4}$; $2\frac{5}{8}$; $3\frac{5}{8}$; $5\frac{2}{7}$; $8\frac{5}{8}$; $7\frac{5}{8}$; $10\frac{2}{3}$; $15\frac{1}{2}$; $16\frac{2}{4}$; $15\frac{1}{3}$; $14\frac{1}{2}$; $17\frac{2}{3}$; $12\frac{2}{3}$; $15\frac{2}{4}$; $16\frac{5}{6}$; $14\frac{5}{8}$.

1. I bought a house for $4000 and sold it for 80% of the cost. For how much did I sell it?

2. A merchant whose income is $2000 a year spends 75% of it. How much can he save?

3. Goods costing $800 were sold for $\frac{3}{4}$ of their cost. What was the loss?

4. What is the interest of $600 for 2 yr. 3 mo. at 8%?

5. What is the amount of $720 for 7 yr. at 10%?

Rapidly reduce to improper fractions :

$4\frac{2}{4}$; $5\frac{1}{8}$; $6\frac{2}{3}$; $8\frac{1}{4}$; $9\frac{1}{3}$; $6\frac{5}{6}$; $7\frac{2}{5}$; $8\frac{2}{3}$; $2\frac{7}{8}$; $5\frac{3}{4}$. $12\frac{1}{2}$; $14\frac{1}{4}$; $13\frac{1}{3}$; $15\frac{2}{3}$; $16\frac{1}{4}$; $11\frac{4}{5}$; $18\frac{2}{3}$; $24\frac{1}{2}$; $32\frac{1}{3}$; $36\frac{2}{3}$.

6. What is the interest of $300 for 4 yr. 6 mo. at 6%?

7. Find the amount of $200 for 2 yr. 3 mo. at 8%.

8. A dressmaker bought 12 yd. of cloth. She used 66⅔% of it for a dress. How many yards had she left?

9. How much is gained by selling baskets at 20% profit, when the cost is 45¢ apiece?

10. If .25 of a pound of sugar is worth 1¢ how much sugar will $5.76 buy?

Written.

1. A dealer sold a horse for $340, which was 15% less than its value. What was its value?

2. After a bank deposit was increased 40%, it amounted to $840. How much was it at first?

3. A furniture dealer sold two parlor sets for $450 each. On one he made 15%, on the other he lost 15%. How much did each cost him?

4. Find the interest of $76 for 2 yr. 2 mo. at 5%.

5. Find the amount of $370 for 1 yr. 10 mo. at 6%.

———

6. If a man borrows $9700 in New York at 6% and loans it in Colorado at 10%, how much will he gain in 1 yr. 6 mo.?

7. A lumberman sold 36840 ft. of lumber at $21.12 per M., and gained 28%. How much would he have gained or lost, had he sold it at $17 per M.?

8. At what per cent above cost must a merchant mark damaged goods so that he may deduct 25% from his asking price, and sell at cost?

9. The front wheel of a buggy is 42 in. in diameter. How many revolutions does it make in going a mile?

10. Find the amount of $500.50 for 3 yr. 6 mo. at 4%.

XC

Oral.

Rapidly answer:

48 is $\frac{2}{3}$ of what number? $\frac{4}{5}$ of what number? $\frac{2}{4}$? $\frac{1}{8}$?
$\frac{3}{8}$? $\frac{1}{6}$? $\frac{6}{7}$? $\frac{2}{5}$?

24 is .12$\frac{1}{2}$ of what number? .75 of what number? .60?
.66$\frac{2}{3}$? .16$\frac{2}{3}$? .37$\frac{1}{2}$? .25? .80?

16 is 33$\frac{1}{3}$% of what number? 20% of what number?
25%? 66$\frac{2}{3}$%? 16$\frac{2}{3}$%? 6$\frac{1}{4}$%? 8$\frac{1}{3}$%?

1. A man having $2000 spent $1600. What per cent
had he left?

2. What per cent of 3 gal. is 6 pt. ?

3. What per cent of 1 pk. is 2 pt. ?

4. A knife that cost 30 ¢ was sold for 45 ¢. Find the
per cent of gain.

5. A dealer sold a sled for $3 that cost him $4.
What per cent did he lose?

Rapidly answer:

15 is $\frac{1}{4}$ of what number? $\frac{3}{8}$ of what number? $\frac{3}{4}$? $\frac{5}{8}$?
$\frac{5}{7}$? $\frac{1}{8}$? $\frac{1}{6}$? $\frac{1}{12}$?

18 is .16 of what number? .60 of what number? .25?
.12$\frac{1}{2}$? .75? .33$\frac{1}{3}$? .20? .90?

36 is 16$\frac{2}{3}$% of what number? 80% of what number?
60%? 66$\frac{2}{3}$%? 75%? 20%? 33$\frac{1}{3}$%?

6. If $\frac{5}{6}$ of a barrel of flour costs $5, how much will
4$\frac{1}{2}$ bbl. cost?

7. What per cent of 2 ft. is 1 in.? :

8. A boy lost 20 ¢ by selling a sled for $1.40. What
per cent did he lose?

9. At $4\frac{1}{2}$ ¢ a pint, how much will 5 qt. 1 pt. of milk cost?

10. If 5 yd. of lace cost 90 ¢, how much will $\frac{1}{2}$ of a yard cost?

Written.

1. How much will 1240 pickets cost at 1.12\frac{1}{2}$ per C.?

2. How much will 4680 lb. of hay cost at $12.50 per ton?

3. Two per cent of $125.50 is 8 % of what amount?

4. A pile of wood is 112 ft. long, 12 ft. wide, and 10 ft. high. Find its value at $4.50 a cord.

5. What is the sum of $\dfrac{9\frac{7}{2}}{7\frac{3}{5}}$ and $\dfrac{13\frac{4}{7}}{10\frac{10}{21}}$.

---

6. A man having deposited in the bank $3606, afterward drew out $450.75. What per cent of the sum deposited did he withdraw?

7. A man who owned real estate for which he paid $7400, failed in business and was obliged to sell at auction at a loss of 23 %. How much did the property bring?

8. What is the cost of a dozen boards, each 15 ft. long and 1 ft. wide, at $18 per M. ft. ?

9. Mr. Watson bought some goods at $1.20 a yard and sold them at $1.56 a yard. Find the gain per cent.

10. A lawyer employed to collect a debt of $1250 compromised for 95 %. He charged $4\frac{1}{4}$ % commission. How much was his commission?

XCI

Oral.

Rapidly find the base:

Percentage	Rate	Percentage	Rate	Percentage	Rate
80 yd.	20 %	$120	40 %	$140	$14\frac{2}{7}$%
76 ft.	75 %	$150	$66\frac{2}{3}$%	$280	$62\frac{1}{2}$%
60 in.	60 %	$160	80 %	$240	75 %
27 lb.	$33\frac{1}{3}$%	$200	50 %	$300	30 %

What is a prime number? Name the prime numbers from 50 to 70.

What is a composite number? Name the composite numbers from 5 to 50.

1. A man's income is $1800 a year. He pays 25 % of it for house rent. How much rent does he pay?

2. A cattle dealer had 1200 head of cattle and bought 25 % more. How many had he then?

3. A farmer raised 600 bu. of oats and sold $8\frac{1}{3}$% of them. How many had he left?

4. James bought a book for 40 ¢ and sold it at a profit of 20 %. How much did he gain?

5. A merchant bought an article for $3.60 and sold it to gain 20 %. What was the selling price?

Rapidly find the base:

Percentage	Rate	Percentage	Rate	Percentage	Rate
$30	40 %	$12	25 %	$45	$83\frac{1}{3}$%
$25	20 %	$15	60 %	$50	40 %
$24	$37\frac{1}{2}$%	$18	$28\frac{4}{7}$%	$48	80 %
$27	75 %	$40	10 %	$51	75 %

6. An agent sold property to the value of $3000. What was his commission at 3 %?

7. Goods that cost $4 are sold at a loss of 25 %. For how much are they sold?

8. An agent sold property for $4500 at a commission of 2 %. What was his commission?

9. What is the commission on the sale of property at $6000, if the rate of commission is $\frac{3}{8}$ %?

10. What is the gain at 30 % on 60 T. of steel bought at $90 a ton?

Written.

1. A man owned 460 A. of land. He sold to one neighbor 25 % of his land and to another 20 %. How many acres did he sell?

2. A farmer having 540 bu. of wheat sold 33⅓ % of it. How many bushels remained?

3. A man had 1260 cattle and bought 30 % more. How many had he then?

4. A house that was valued at $2400 was rented so that the yearly rent amounted to 12 % of the value of the property. What was the monthly rent of the house?

5. A woodshed 12 ft. long 9 ft. wide and 8 ft. high is $\frac{3}{4}$ full of wood. What is the value of the wood at $2.50 a cord?

6. A merchant sold a consignment of clothes for $358. What was his commission at 2½ %?

7. An agent's commission for selling grain was $19.20. If the rate of commission was 1½ %, what was the amount of the sale?

8. What number divided by $25\frac{2}{25}$ will give $83\frac{1}{3}$ for a quotient?

9. Divide the product of $5\frac{5}{8}$ and $8\frac{1}{8}$ by their difference.

10. $\frac{15}{16}$ of $83\frac{1}{3}$ is what part of $62\frac{1}{2} \times 1\frac{7}{8}$?

XCII

Oral.

Rapidly find the cost:

Gain	Loss	Rate	Gain	Loss	Rate
$20	$40	$12\frac{1}{2}\%$	$40	$30	10%
$15	$5	20%	$42	$36	$66\frac{2}{3}\%$

1. A teacher's salary is $3200 a year, and he saves $800 a year. What per cent of his salary does he spend?

2. An organ was sold for $75, which was at a gain of $15. What was the gain per cent?

3. A coat was bought for $30 and sold for $24. What was the loss per cent?

4. An agent received $40 commission for sales amounting to $8000. What was the per cent of commission?

5. A broker sold property for $25000 and received a commission of $500. What was the rate of commission?

Rapidly find the cost:

Gain	Loss	Rate	Gain	Loss	Rate
$120	$60	30%	$56	$54	25%
$80	$20	60%	$150	$160	$14\frac{2}{7}\%$

6. What is the rate on $100 if a commission of $45 is paid for collecting $3000?

7. I sold a yard of silk for $1.50 and lost 25¢. Find my per cent of loss.

8. Mary has 12¢, which is 20 % of her sister's money and 25 % of her brother's money. How many cents has her brother? How many cents has her sister?

9. How much will 4 T. 400 lb. of coal cost at $5 a ton?

10. How much will 350 lb. of hay cost at 60¢ per hundred pounds?

Written.

1. A man who failed in business had only $4200. If he owed $12000, what per cent did his creditors receive?

2. From a can containing 9 gal. of oil, 2 gal. 2 qt. were sold. What per cent remained?

3. Goods costing $250 were sold for $230. What per cent was lost?

4. A dealer sold a horse for $245 and gained $35. What per cent did he gain?

5. Simplify $6\frac{2}{7} - 4\frac{1}{8}$ of $1\frac{7}{33}$.

---

6. An agent received $38.25 commission for sales amounting to $850. What was the rate of commission?

7. Write a check for the net proceeds of the following sale: Mr. Jas. Burns sold for account of Mr. Chas. Clark, 600 bu. of wheat @ 80¢ and 800 bu. of corn @ 45¢. Charges: freight, $74.20, cartage, $12.35, commission, 2 %.

8. What is the brokerage for selling 12800 bu. of wheat at 75¢ per bushel, if the rate of brokerage is $\frac{1}{8}$ %?

9. An agent's commission was $46.80 for selling 360 yd. of cloth at $3.25 per yard. What was the rate of commission?

10. A stationer bought a gross of pens for 72¢ and retailed them at the rate of 3 pens for 2¢. How much did he make on the gross?

XCIII

Oral.

Rapidly find the amount of sale:

Commission	Rate	Commission	Rate	Commission	Rate
$50	2 %	$150	1½ %	$270	⅞ %
$160	½ %	$300	1¼ %	$360	¾ %

1. A owns ¼ of a ship, which is 16⅔ % less than B owns. What fractional part of the ship does B own?

2. What number increased by 25 % of itself amounts to 60? (Explain this.)

3. What number diminished by 20 % of itself equals 36? (Explain this.)

4. A man invested 12½ % of his money in horses and cattle, 62½ % in a farm, and had $4500 left. How much money had he at first?

5. A man drew 66⅔ % of his money from the bank and paid 87½ % of it for a farm costing $5600. How much money had he remaining in the bank?

6. Base $600; rate 16⅔ %. Find the amount.

7. Cost $720; rate 12½ %. Find the selling price.

8. Find the amount of $560 for 3 yr. at 6 %.

9. Divide 1.6 by .08.

10. Divide 2.4 by 400.

Written.

1. 12½ % of $1120 is 12½ % less than what number?

2. I sold a lot for $714, which was at a loss of 15%. What was the loss?

3. If I sell ¾ of an article for what ⅞ of it cost, what per cent do I gain?

4. An agent sold a farm for $3960, at 2½% commission. What was his commission?

5. Divide .024 by 800.

---

6. Two bicycles were sold for $48 each. On one there was a gain of 20%, on the other a loss of 20%. How much was the gain or loss on both?

7. A salesman asked an advance of 20% on the cost of some goods, but was obliged to sell at 20% less than his asking price. Find the gain or loss per cent.

8. I sold a carriage for $240, which was at a gain of 20%. How much should I have lost per cent had I sold it for $180?

9. I own ⅔ of a factory and sell 16⅔% of my share for $800, which is 20% less than its value. Find the value of the factory.

10. I exchanged 11⅞ cd. of wood at $4½ a cord for flour at $9½ a barrel. How much flour did I receive?

XCIV

Oral.

Rapidly answer:

$$\frac{6 \times 4}{8 \times 12} \qquad \frac{4 \times 8}{8 \times 16} \qquad \frac{5 \times 7}{14 \times 20} \qquad \frac{8 \times 9}{27 \times 32}$$

1. A grocer lost 10% by selling butter 4¢ per pound less than cost. Find the cost.

2. A cow was sold for $65, which was at a gain of 25 %. How much did it cost?

3. Find the cost of a wagon sold for $26 at a loss of 35 %.

4. A house was sold for $1120, which was at a loss of 33⅓ %. Find the cost.

5. A farmer sold 105 bu. of oats, which was 35 % of all he raised. How much did he raise?

———

Rapidly answer:

$$\frac{4 \times 8}{2 \times 4} \qquad \frac{6 \times 9}{3 \times 3} \qquad \frac{21 \times 4}{7 \times 2} \qquad \frac{8 \times 4}{4 \times 2}$$

6. 12½ % of 96 is 33⅓ % of what number?

7. A farmer sold 7.5 A. of land, which was 15 % of all he owned. How much did he own?

8. A tailor sold a coat for $26, which was 30 % more than it cost him. How much did it cost him?

9. How shall I mark calico that cost 8¢ a yard so that I may deduct 10 % from the marked price and still gain 12½ % on the cost?

10. I cleared $12 by selling a watch at a gain of 25 %. What was the cost?

Written.

1. An agent bought $1545 worth of wheat, and charged the dealer 3 % commission. How much did the wheat cost the dealer?

2. An agent bought $2600 worth of goods at 5 % commission. Find his commission and the total cost of the goods to the dealer.

3. A real estate agent invested $9816 in choice land. Find his commission at $2\frac{1}{4}\%$.

4. Write out the following cash account: Receipts: May 1, 1912, balance on hand, $16.24; May 3, rents, $75; May 15, earnings, $80. Amounts paid out: May 5, board, $35; May 8, laundry, $3.35, May 20, incidentals, $20.67; May 28, clothing, $45.

5. A dealer in horses sold 24 for $150 each. On $\frac{1}{3}$ he gained 30 % and on the remainder he lost 20 %. How much did he gain or lose on all?

----

6. Mark the selling price of goods that cost $4.20, and were sold at a gain of $33\frac{1}{3}\%$, if the key is "Republican."

7. If I sell gloves at the rate of $18 per dozen I gain 25 %. How should I mark the cost of each pair from the key "Handsomely"?

8. An auctioneer received $135 for selling a house, which was at the rate of $1\frac{1}{2}\%$. For how much did the house sell, and how much did the owner receive?

9. For how much must I buy boots by the case (12 pairs) to gain 15 % by selling them at $4.60 a pair?

10. If $5\frac{1}{2}$ yd. of calico is worth $1.10, how much is $43\frac{1}{4}$ yd. worth?

XCV

Oral.

Rapidly answer:

36 is $\frac{1}{5}$ more than what number? $\frac{4}{5}$ more? $\frac{1}{8}$ more?

36 is $\frac{1}{5}$ less than what number? $\frac{7}{8}$ less? $\frac{1}{3}$ less? $\frac{2}{3}$ less?

48 is .60 more than what number? .20 more? $.33\frac{1}{3}$ more? .50 more?

24 is .62½ less than what number? .25 less? .20 less? 11⅛ less?

56 is 16⅔% more than what number? 14⅔% more? 40% more? 75% more?

54 is 25% less than what number? 62½% less? 33⅛% less? 75% less?

1. Find the cost of velvet sold at $4.20 a yard at a gain of 20%.

2. For how much should pork have been sold per barrel to gain 16⅔% if 33⅓% was lost by selling it at $16 a barrel?

3. If ⅝ of a barrel of flour costs $2.50, how much will 4¼ bbl. cost?

4. Find the cost of butter sold for 36¢ a pound at a gain of 20%.

5. I sold an article for 25¢ and gained 25%. What would have been the gain or loss per cent had I sold it for 22¢?

Rapidly answer:

80 is ½% of what number? 64 is 11⅛% less than what number?

72 is 14⅔% more than what number? What per cent of 72 is 18?

6. I bought an article for $80, sold it and gained 100%. Find the gain; the selling price.

7. I sold a lamp for $7.20 and gained 12½%. Find the cost.

8. A dealer sold a horse for $120 and lost 20%. For how much would he have to sell it to gain 40%?

9. When $2\frac{1}{2}$ yd. of calico cost 25¢, how many yards can be bought for $1? (Analyze this.)

10. A boy spent $\frac{1}{4}$ of his money and gave $\frac{1}{8}$ of it to his sister and then had 25¢ left. How much had he at first?

Written.

1. There are 31.5 gal. in a barrel. How many barrels are there in 992.25 gal.?

2. A dealer gained 20 % on flour that he sold for $6 a barrel. The market advanced and he sold the rest of his stock for $6.50 a barrel. Find the per cent of gain after the advance.

3. Which is better and how much better, to invest $6000 at 6 % for a year, or to buy a house for $6000 and rent it at $20 a month and sell it at the end of a year for $6500, after paying $125 for taxes and repairs?

4. Mr. Alexander rented a wagon on September 9, and returned it on November 12. At $1.50 a day how much did he owe for the use of the wagon?

5. Write out the following cash account:

On hand, July 1, 1913, $25. Paid rent, July 2, $15.50; paid labor, July 15, $17.75; paid for merchandise, July 25, $500.66. Received by sale of merchandise to July 28, $600.25.

———

6. Mr. Jones owned $\frac{3}{4}$ of a section * of land. He sold $\frac{5}{8}$ of his share to Mr. Brown, who gave $\frac{2}{5}$ of his part to his son. What part of the whole section did Mr. Brown's son receive? How many acres did he receive?

* A section of land = 1 sq. mi. or 640 A.

7. Mr. Wood sold his farm containing 72.85 A. for $2185.50. How much did he receive for it per acre?

8. Reduce $\frac{2}{8}$ of a ton to lower denominations.

9. The walls of a cellar 32 ft. by 24 ft. are 6 ft. high and $1\frac{1}{2}$ ft. thick. How much did it cost to build them at $1.25 a perch ($24\frac{3}{4}$ cu. ft.)?

10. What must be the length of a load of wood that is 3 ft. high and 5 ft. 4 in. wide, to contain a cord?

XCVI

Oral.

Rapidly find the base :

Amount	Rate	Diff.	Rate	Amount	Rate
$144	20 %	$120	$14\frac{2}{7}$ %	$180	$12\frac{1}{2}$ %
$60	25 %	$40	$66\frac{2}{3}$ %	$480	$33\frac{1}{3}$ %
$120	60 %	$14	$22\frac{2}{9}$ %	$350	$16\frac{2}{3}$ %
$55	$37\frac{1}{2}$ %	$36	40 %	$500	$11\frac{1}{9}$ %

1. Mr. James spent 40 % of his fortune and had $3500 left. What was the amount of his fortune?

2. In an army of 15000 men 4000 were killed and 5000 were wounded. What per cent of the army was unhurt?

3. A grocer having 1600 lb. of sugar sold $\frac{1}{4}$ of it in a week and $\frac{1}{8}$ of what remained the week following. What per cent of the whole quantity remained?

4. A colt was bought for $60 and sold at 10 % less than cost. How much was lost?

5. A merchant bought an article for $3.60 and sold it at a profit of 20 %. Find the selling price.

Rapidly add:

12	14	21	22	32	17	18	23	17	27	24	18	24	17
18	16	23	17	26	28	24	22	25	17	36	27	32	25
15	20	24	31	19	32	14	16	33	25	15	15	43	13

6. How many acres are there in $\frac{1}{4}$ of a section of land? in $\frac{3}{4}$ of a section? in $\frac{5}{8}$ of a section?

7. How many rods of fence will inclose 1 A. of land 16 rd. long and 10 rd. wide?

8. A profit of 8¢ per pound was made by selling tea at $16\frac{2}{3}$ % advance. How much did it cost?

9. A man sold two lots for $120 each. He gained 20 % on one, and lost 20 % on the other. Find his entire gain or loss.

10. How much must be paid for 32 bbl. of flour, if 8 bbl. cost $40?

Written.

1. A lot of silks were bought by a merchant for 60¢ per yard. How must the goods be marked that he may deduct 20 % from the marked price and still make a profit of 20 %?

2. A, B, and C were partners. A furnished $33\frac{1}{3}$ % of the capital; B, $37\frac{1}{2}$ %; and C, $2450. Find the capital of the firm.

3. A furnished $\frac{2}{3}$ of the money in a business; B, $\frac{5}{14}$ of it; and C, the remainder, which was $5121. How much capital did each furnish?

4. Reduce 64130 oz. avoirdupois to units of higher denominations.

5. A gain of $37\frac{1}{2}\%$ on $4800 is equivalent to a gain of $62\frac{1}{2}\%$ on what amount?

6. Make out and receipt the following bill: Mr. James Chapman bought of Merril & Brothers, 56 pr. calf boots @ $3.75, 85 pr. gaiters @ $1.12, 50 pr. rubbers @ 60 ¢, 60 pr. slippers @ 90 ¢.

7. How shall I mark goods that cost $500 in order to deduct 15 % from the marked price and gain 16 %?

8. A man owned $\frac{7}{8}$ of a boat, and sold $\frac{3}{4}$ of his share for $1785. What was the value of the boat? of the part he had left?

9. A merchant sold goods for $840 and thereby lost 16 %. Find the selling price that would enable him to gain $12\frac{1}{2}\%$.

10. If $5\frac{1}{2}$ lb. of coffee cost $1\frac{1}{10}$, how much will $27\frac{1}{2}$ lb. cost?

XCVII

. **Oral.**

Rapidly find the cost:

Selling Price	Rate of Gain	Selling Price	Rate of Loss	Selling Price	Rate of Loss
$30	25 %	$20	20 %	$100	20 %
$45	20 %	$52	25 %	$120	$14\frac{2}{7}\%$
$27	$12\frac{1}{2}\%$	$72	$62\frac{1}{2}\%$	$150	$28\frac{4}{7}\%$

1. What is the interest of $30 for 5 yr. at 4 %?

2. A sofa was bought at auction for $20 and having been repaired at a cost of 20 % was sold at an advance of $33\frac{1}{3}\%$ on its whole cost. Find the gain.

3. Mr. Townsend sold a horse for $91 and thereby lost 9 %. How much did the horse cost him?

4. A drover bought a cow for 20 % less than its value and sold it for 30 % more than its value. What per cent of the value did he gain? What per cent of the cost?

5. A picture dealer sold two pictures for $150 each. On one he gained 25 % and on the other he lost 25 %. How much did he gain or lose on both?

Rapidly find the cost:

Selling Price	Rate of Gain	Selling Price	Rate of Loss	Selling Price	Rate of Gain
$200	$66\frac{2}{3}$ %	$300	20 %	$320	$33\frac{1}{3}$ %
$240	20 %	$640	25 %	$360	$12\frac{1}{2}$ %
$250	25 %	$700	$28\frac{4}{7}$ %	$390	$62\frac{1}{2}$ %

6. If a class registers 48 pupils and $16\frac{2}{3}$ % are absent, how many are present? How many are absent?

7. If $16\frac{2}{3}$ % of a class of boys are absent and 45 are present, how many are there on register?

8. What per cent is gained by selling at double the cost? What per cent is lost by selling at $\frac{1}{2}$ the cost?

9. If I sell an article for $\frac{3}{4}$ of its cost, what per cent do I lose?

10. Goods are bought at 25 % below market price and sold at 25 % above that price. Find the gain per cent.

Written.

1. Find the sum of $\frac{7\frac{7}{8}}{12\frac{1}{4}}$ and $\frac{14\frac{2}{7}}{16\frac{2}{3}}$.

2. What number added to $\frac{2}{3}$ of $18\frac{3}{4}$ will equal $\frac{9}{10}$ of $41\frac{2}{3}$?

3. Multiply $\frac{.045}{.72}$ by $\frac{3.125}{87.5}$; divide the product by 10.

4. If 8.125 yd. cost $13, how much will 11.25 yd. cost?

5. Multiply the sum of 10.1 and 8.65 by their difference and divide the product by 46.4.

———

6. Mr. Morgan sold his horse for $198, which was 10 % less than his asking price, and the asking price was 10 % more than the cost. How much did the horse cost?

7. A man owned .28 of a farm. He sold 25 % of his share, and had 78.54 acres left. How many acres had he at first, and how many acres were there in the entire farm?

8. A farmer paid $462 for sheep at $3.85 each; $8\frac{1}{3}$ % having died, at what price per head must he sell the remainder to sustain no loss?

9. A man owned $\frac{4}{5}$ of a mill and sold 35 % of his share for $24640. Find the value of the mill.

10. Divide .003125 by .125; .005 by .0015.

XCVIII

Oral.

Rapidly find the amount of sale:

Net Proceeds	Rate	Net Proceeds	Rate	Net Proceeds	Rate
$196	2 %	$760	5 %	$6930	1 %
$2955	$1\frac{1}{2}$ %	$19550	$2\frac{1}{4}$ %	$7720	$3\frac{1}{2}$ %
$485	3 %	$3980	$\frac{1}{2}$ %	$4700	6 %

1. A grocer sells 10 lb. of butter for what 8 lb. cost him. What per cent does he lose?

2. If 5 men can do a piece of work in 10 da. how many men working at the same rate will do the work in 5 da.?

3. James, after losing $\frac{2}{3}$ of his money, found that $12 was $\frac{3}{4}$ of what remained. How much had he at first?

4. I bought oranges at the rate of 3 for 4¢ and sold them at the rate of 2 for 3¢. Find the rate per cent of gain.

5. A dress sold for $36, which was at a gain of 20 % of the cost. How much did it cost?

Rapidly find the terms marked "?":

Cost	Rate of Gain	Rate of Loss	Gain	Loss	Selling Price
$1500	?	—	$500	—	?
$8400	—	$\frac{1}{4}$%	—	?	?
$3200	$37\frac{1}{2}$%	—	?	—	?
?	—	$16\frac{2}{3}$%	—	?	$1000
?	—	?	—	$600	$4200

6. A table marked to sell for $45 was marked down 20 % and then sold. For how much was it sold?

7. A house and lot that cost $8000 were sold for $10000. What per cent was gained?

8. A man sold a house for $6000, which was $1000 more than it cost him. What per cent did he make?

9. What per cent of the cost is made on goods bought at $\frac{2}{3}$ of the market price and sold at $\frac{4}{5}$ of the market price?

10. Goods listed at $150 were sold at $120. What was the rate per cent of loss?

Written.

1. A ship loaded with 3840 bbl. of flour met with a storm and $37\frac{1}{2}$% of the flour was lost. What was the entire loss, if the flour was worth $7.65 a barrel?

2. A commission merchant sold 500 pieces of cloth for $130 a piece and paid the owner $63700. Find the rate per cent of commission.

3. A merchant sold 300 bbl. of flour at $5 a barrel, receiving a commission of $3\frac{1}{2}\%$. He invested the $1500 received for the flour in coffee at 20¢ a pound, and charged 2% commission. How many pounds of coffee did he purchase and how much was his entire commission?

4. A man earned $2.25 a day and spent 10% of his earnings every day for cigars. How much did he spend for cigars during the month of August (omitting Sundays) if August commenced on a Wednesday?

5. Mr. Smith had $3000 in the bank. He drew out 15% of it, then 20% of the remainder, and afterwards deposited $12\frac{1}{2}\%$ of all he had drawn. How much money did he then have in the bank?

------

6. An agent sold $15000 worth of goods on a commission of 10%. He invested the net proceeds in cotton. How many pounds of cotton at 8¢ a pound did he buy? At 5% what was his commission on the purchase?

7. A man who owned $\frac{5}{8}$ of a mill sold 25% of his share for $28000. What part of the whole mill did he still own and what was its value?

8. What per cent of 18 lb. (avoir.) is 5 lb. 8 oz.?

9. If $\frac{5}{8}$ of an article sold for what $\frac{2}{5}$ of it cost, what per cent was lost?

10. Simplify $\dfrac{(3\frac{1}{2} \times 6) - 4\frac{1}{2}}{12\frac{1}{4} - (3 \times 2\frac{1}{8})}$.

XCIX

Oral.

Rapidly find the term marked "?":

$? + \frac{1}{5} = \frac{9}{20}$ $\frac{3}{4} - ? = \frac{5}{12}$ $\frac{1}{2} \times ? = \frac{1}{3}$ $? \div \frac{5}{12} = 2$

$\frac{1}{9} + \frac{1}{12} = ?$ $\frac{5}{8} - \frac{1}{6} = ?$ $? \times \frac{7}{8} = \frac{21}{32}$ $\frac{3}{4} + \frac{1}{2} = ?$

1. A farmer had 400 sheep but lost $\frac{1}{2}\%$ of them by carelessness. How many sheep had he left?

2. A dishonest dealer sold coal 20 % short on every ton. How much coal did a customer lose out of 10 T.?

3. What per cent of the day has passed at 6 o'clock P.M.?

4. A boy bought a pair of skates for $1.20 and sold them for 80¢. What per cent did he lose on them?

5. If a horse consumes $\frac{3}{4}$ of a ton of hay in $\frac{1}{2}$ month, how long will $1\frac{1}{4}$ T. last him?

Rapidly find the term marked "?":

$? + \frac{1}{2} = \frac{3}{4}$ $\frac{4}{5} - \frac{2}{3} = ?$ $? \times \frac{1}{2} = \frac{1}{3}$ $? \div \frac{3}{4} = 1\frac{1}{3}$

$\frac{2}{3} + ? = \frac{5}{6}$ $? - \frac{1}{4} = \frac{5}{8}$ $\frac{3}{4} \times ? = \frac{1}{2}$ $8 \div ? = 10$

6. I lost 10 % by selling goods at 18¢ a yard. Find the cost.

7. After selling 30 % of my land I had 35 A. remaining. How many acres had I at first?

8. Shoes were bought at $2 a pair. At what price should they be marked that 25 % may be deducted and a profit of 50 % be made?

9. A dressmaker bought some silk at 1\frac{1}{2}$ a yard, paying 7\frac{1}{2}$ for it. How many yards did she buy?

10. John's mark in arithmetic was 85, in grammar 75, and in composition 65. What was his average in the three studies?

Written.

1. How must I mark goods that cost 75¢ so as to make 50 % and still deduct 25 % from the marked price?

2. A dealer sold a horse for $132 at a loss of 12 %. What per cent would he have made if the selling price had been $159?

3. A man owns 75 % of a factory and sells 33⅓ % of his share for $7400. Find the value of the factory.

4. A carriage maker sold two carriages for $432 each. On one he gained 20 % and on the other he lost 20 %. What was his entire gain or loss?

5. A grocer bought apples at the rate of ¾ of a peck for 30¢ and sold them at 7¢ a quart. How much did he make on 2¼ bu. of apples?

---

6. A and B were partners. A received $370 of the profit, which was 18½ % of the whole profit. What was the total profit, and what was B's share?

7. If Mr. Black sells his horse for $220 he gains 10 %. What per cent would he gain or lose if he should sell it for 10 % less than $220?

8. A man wishing to sell his horse asked 25 % more than it cost. He finally sold it for 15 % less than his asking price, and thereby gained $7.50. How much did the horse cost him? What was the asking price?

9. A grocer bought 60 gal. of milk at 12¢ a gallon and sold it at 5¢ a quart. What per cent did he make?

10. If ⅛ of John's marbles equals ⅕ of James's, and both together have 48, how many marbles has each?

C

Oral.

Rapidly find the interest:

Principal	Time	Rate	Principal	Time	Rate
$10	1 yr. 2 mo.	6 %	$60	1 yr. 9 mo.	4 %
$20	2 yr. 3 mo.	6 %	$70	2 yr. 6 mo.	5 %
$30	1 yr. 4 mo.	6 %	$80	4 yr. 6 mo.	5 %

1. A puts $800 into a certain business and B, $600. If the profits are $1400, what is the share of each?

2. Mrs. Johnson put up 70 qt. cans of blackberries. How many pecks of fruit did she use?

3. How much must I pay a gross for hairpins, that I may sell them for 3 ¢ a dozen and gain 1 ¢ a dozen?

4. A merchant charged 50 ¢ more than cost for a trunk and thereby gained 10 %. How much did it cost him?

5. If $18 is $\frac{1}{8}$ more than my money, what per cent less than my money is $12?

Rapidly find the interest:

Principal	Time	Rate	Principal	Time	Rate
$100	$1\frac{1}{2}$ yr.	8 %	$220	$1\frac{1}{4}$ yr.	4 %
$150	$2\frac{1}{2}$ yr.	8 %	$240	$2\frac{1}{4}$ yr.	5 %
$180	$1\frac{1}{3}$ yr.	6 %	$260	$3\frac{1}{3}$ yr.	6 %

6. If 7 horses require a pasture of 18 acres, how large a pasture will 350 horses require?

7. If $3\frac{3}{4}$ bu. of grain are used to sow $13\frac{3}{4}$ acres, how many bushels will be required to sow 100 acres?

8. After I have spent $\frac{2}{5}$ of my money, $16 is $\frac{2}{3}$ of what I have left. How much money had I at first?

9. Robert's money increased by its $\frac{1}{2}$ and $\frac{1}{6}$ equals $30. How much money has he ?

10. The minuend is 50. The remainder is 10 % of the minuend. Find the subtrahend.

Written.

1. If a trader makes $15 on a horse which he sells for $195, what per cent does he gain?

2. By selling cloth for $199.20 I lost 17 %. For how much should I have sold it to gain $6\frac{1}{4}$ % ?

3. I paid an agent a commission of $150 at $2\frac{1}{2}$ % to purchase wheat at 1.87\frac{1}{2}$ a bushel. How many bushels did he buy ? Find the amount of the bill.

4. A's money is $12\frac{1}{2}$ % more than B's. What per cent is B's money less than A's ?

5. Simplify $\dfrac{\frac{1}{2}\text{ of }1\frac{1}{4} \times 4\frac{1}{2}}{\frac{5}{66} \times 1\frac{1}{3} \times 3\frac{1}{2}} + \dfrac{3\frac{1}{4} + 4\frac{1}{8}}{4\frac{1}{2} \times 1\frac{2}{3}}$.

6. A cask holding 51 gal. leaked so that 19 gal. 1 pt. remained. What per cent leaked out ?

7. I bought a farm for $4350, which was 16 % more than its value. I sold it at 12 % less than its value. How much did I lose ?

8. A merchant sold the following consignment on $3\frac{3}{4}$ % commission : 640 lb. poultry at 17 ¢, 850 lb. butter at 33 ¢, 1260 doz. eggs at 27 ¢. How much was the commission ? How much did he pay the consignor ?

9. A dealer bought 7 bu. 3 pk. 4 qt. of walnuts at $4.80 a bushel and sold them all for $50.40. What was the gain per cent ?

10. Find the interest of $2500 for 3 yr. 3 mo. at 6 %.

TABLES

DRY MEASURE

2 pints (pt.) = 1 quart (qt.)
8 quarts = 1 peck (pk.)
4 pecks = 1 bushel (bu.)
$\left.\begin{array}{l}\text{64 pints}\\\text{32 quarts}\end{array}\right\}$ = 1 bushel
2150.4 cu. in. = 1 bushel

LIQUID MEASURE

4 gills (gi.) = 1 pint (pt.)
2 pints = 1 quart (qt.)
4 quarts = 1 gallon
$31\frac{1}{2}$ gallons = 1 barrel (bbl.)
63 gallons = 1 hogshead (hhd.)
231 cu. in. = 1 gallon

LONG MEASURE

12 inches (in.) = 1 foot (ft.)
3 feet = 1 yard (yd.)
$5\frac{1}{2}$ yd. or $16\frac{1}{2}$ ft. = 1 rod (rd.)
320 rods = 1 mile (mi.)
$\left.\begin{array}{l}\text{63360 inches}\\\text{5280 feet}\\\text{1760 yards}\end{array}\right\}$ = 1 mile
4 inches = 1 hand
3 feet = 1 pace
6 feet = 1 fathom

SQUARE MEASURE

144 square inches = 1 square foot
9 square feet = 1 square yard
$\left.\begin{array}{l}30\frac{1}{4}\text{ square yards}\\272\frac{1}{4}\text{ square feet}\end{array}\right\}$ = 1 square rod
160 square rods = 1 acre (A.)
640 acres = 1 square mile
1 mile square = 1 section of
land
36 square miles = 1 township
100 square feet = 1 square

CUBIC MEASURE

1728 cubic inches = 1 cubic foot
27 cubic feet = 1 cubic yard
128 cubic feet = 1 cord
$24\frac{3}{4}$ cubic feet = 1 perch

UNITED STATES MONEY

10 mills (m.) = 1 cent (¢ or ct.)
10 cents = 1 dime (d.)
10 dimes = 1 dollar ($)

AVOIRDUPOIS WEIGHT

16 ounces (oz.) = 1 pound (lb.)
100 pounds = 1 hundred-
20 hundred-⎫
weight   ⎬ = 1 ton (T.)
2000 pounds⎭   weight (cwt.)
2240 pounds = 1 long ton
196 pounds = 1 bbl. flour
437½ grains = 1 ounce
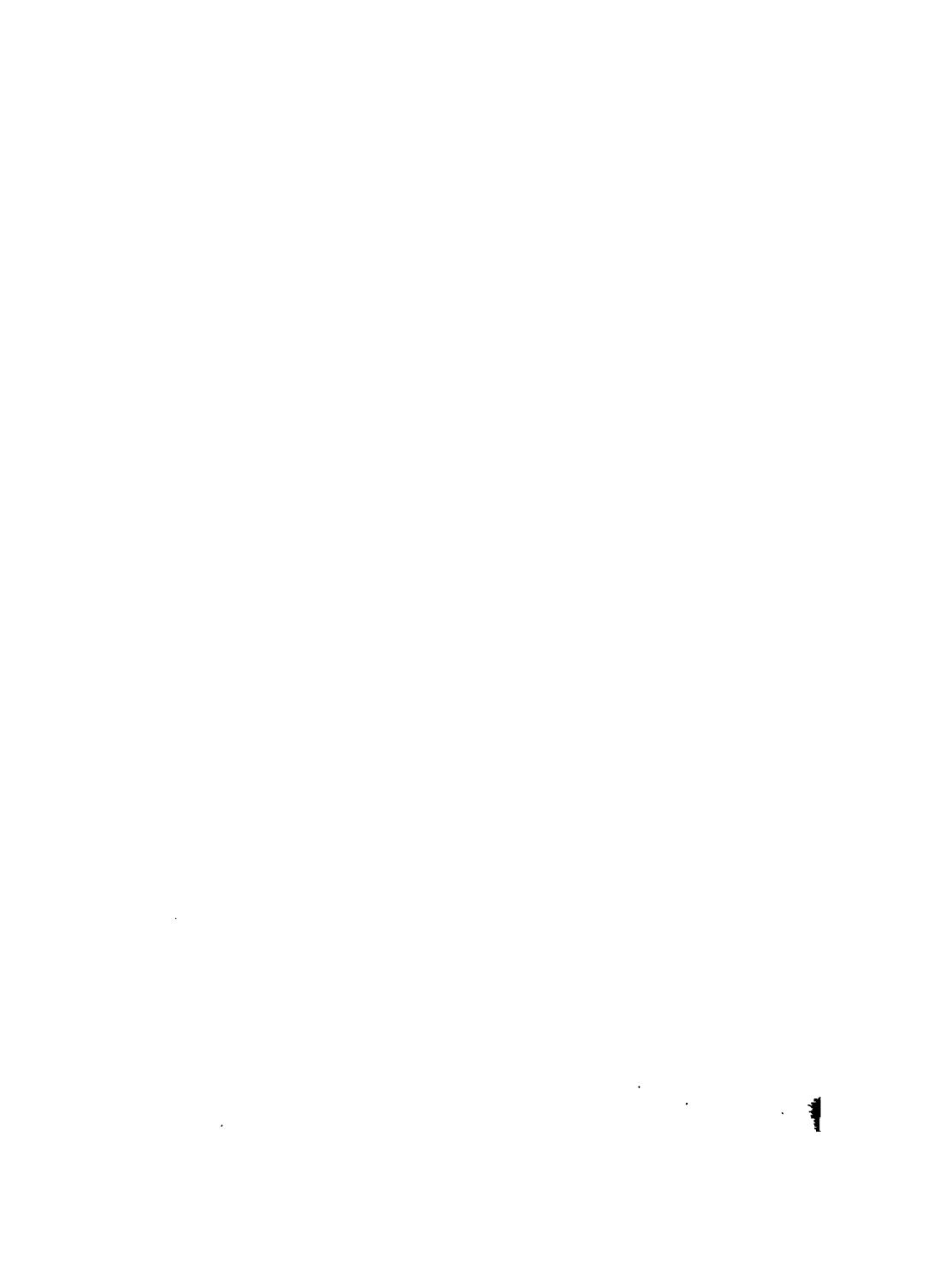7000 grains   = 1 pound

TIME TABLE

60 seconds (sec.) = 1 minute (min.)
60 minutes = 1 hour (hr.)
24 hours = 1 day (da.)
7 days = 1 week (wk.)
52 weeks 1 day ⎫ = 1 common year
or 365 days ⎭   (yr.)
366 days = 1 leap year
12 months (mo.) = 1 year
100 years = 1 century

MISCELLANEOUS TABLE

12 things = 1 dozen (doz.)
12 dozen = 1 gross (gr.)
12 gross = 1 great gross
24 sheets = 1 quire (qr.)
20 quires = 1 ream (rm.)
10 reams = 1 bundle
20 things = 1 score